74-10

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AUGUST 29, 1974

THIS ISSUE CONTAINS:

U.S. Department of Transportation
National Highway Traffic Safety Administration

HighwaySafetyLiterature

...A MONTHLY ABSTRACT JOURNAL

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See serial citation: Obtain through normal loan or purchase of the given serial.

SAE: Society of Automotive Engineers, Dept. HSL, 400 Commonwealth Drive, Warrendale, Pa. 15096. Order by title and SAE report number.

TRB: Transportation Research Board, National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D.C. 20418.

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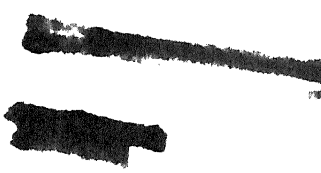

HS-014 464

IT'S DARK OUT THERE

Nighttime driving and the increased accident rate at night are examined with emphasis on causes of accidents. Vision is cited as the single most important factor in nighttime driving since perceptual ability diminishes at night. Peripheral vision, dark adaptation, and glare resistance are described. Driving techniques are also discussed, including speed, following distance, and emergency procedures.

Publ: Driver v7 n10 p9-12 (Mar 1974)
1974
Availability: See serial citation

HS-014 465

ON-LINE ENGINE TUNING FOR EXHAUST EMISSION CONTROL

The rationale for on-line engine tuning for exhaust emission control is described and methods for achieving it outlined. Hardware requirements for the application of a feedback loop to a carburation system are given: a monitoring device indicating the operating conditions, and a device for regulating the air/fuel ratio during engine running. Methods for closing and testing the control loop are shown, and the development of a practical system is discussed. It is concluded that the use of a feedback control system for carburetors would provide a means of maintaining the air/fuel ratio at a constant level despite changes in operating conditions and component wear. Application of the system does not appear to present any insurmountable problems, and the additional cost would be small and well justified.

by M. S. Bolton; J. Swithenbank
Publ: Journal of Automotive Engineering v4 n4 p18-22 (Aug 1973)
1973
Availability: See serial citation

HS-014 466

HOW WILL THE ENERGY CRISIS AFFECT HIGHWAY SAFETY?

The impact of the energy crisis on highway safety is examined with focus on restrictions on driving frequency. The relationship of accident rates to lowered speed limits is discussed, and fatality rates are shown to decrease. Motorcycle usage increases due to the energy crisis are described, and it is noted that their benefits regarding fuel economy have to be weighed against the cost in terms of safety. The safety and fuel consumption tradeoff must also be made for small cars.

by F. M. Council; P. F. Waller
Publ: Traffic Safety v74 n4 p12-4, 39, 40 (Apr 1974)
1974
Availability: See serial citation

HS-014 467

HOW TRANSIT COMPANIES STAND ON SAFETY

Survey questionnaires on transit system safety throughout the United States and Canada are evaluated. Questions ranged from the number of drivers employed to the kind of incentives used to encourage safe operation of company vehicles. Average accident frequency rate was 57.25 accidents per million miles. The overall results showed that any city that wants a more accident-free and loss-controled-oriented mass transportation system must be willing to work and pay for it. Methods are outlined. The survey also revealed other transit safety factors, such as driver hiring procedures, management interest, the company safety program and safety director training, driver selection, training, and supervision, and management policy regarding accident reporting and records, safe driver recognition, incentives, supervision, and budget.

by M. Pavilon
Publ: Traffic Safety v74 n4 p22-4, 36-9 (Apr 1974)
1974
Availability: See serial citation

HS-014 468

ANALYSIS AND DESIGN OF EXHAUST MUFFLERS. RECENT DEVELOPMENTS

Current state of the art of analysis and design of exhaust mufflers is described. The challenge of the characterization of the complex exhaust system of a multicylinder engine as an acoustic source with a certain internal impedance is cited, and a mathematical model is recommended to predict the magnitude and spectrum of the exhaust noise at any speed and load. The effect of partial or full reversal of flow on noise attenuation is noted.

by M. L. Munjal; A. V. Sreenath
Publ: Shock and Vibration Digest v5 n11 p2-14 (Nov 1973)
1973 ; 50refs
Availability: See serial citation

HS-014 469

ON HIGHWAYS AND AIR CUSHIONS, TOMORROW'S TRANSPORTATION IS RACING FOR THE PLASTIC REVOLUTION

Developments in the automotive industry seen by a cross section of technical and market analysts are described including advances within the state of the art anticipated between 1973 and 1985, as well as an intimation of some of the more visionary concepts beyond. Emphasis on lightweight plastic bodies, polypropylene and copolymers for interior trim parts, and structural foam seat components is cited. Processing and material types are discussed along with the use of plastics in the engine and gas types. The advent of all-plastic trains, tracked air cushion vehicles, personal rapid transit systems, and tube vehicle system is anticipated, as well as increased use of plastics in commercial aircraft.

by A. S. Wood
Publ: Modern Plastics v50 n10 p88-90 (Oct 1973)
1973
Availability: See serial citation

HS-014 470

A HYBRID MODEL OF AN AUTOMATED ENGINE TEST BED

A hybrid model of an automated engine test bed is described and found to be very useful in studying the behavior of the system under closed loop control. Different system parameters were varied and their effects on the system response were studied. The California cycle was run successfully on the model by feeding the cycle requirements as a speed setting to the speed controller and an input to the throttle actuator, necessitating disconnecting the closed loop torque control.

by J. I. Soliman
Publ: Journal of Automotive Engineering v4 n5 p13-8 (Oct 1973)
1973
Availability: See serial citation

HS-014 471

BRAKE PERFORMANCE CHARTS

Improved versions of drum brake performance charts are presented along with an additional chart which may be used as an alternative. The application of the charts were previously described in an article entitled "Rapid Estimation of Drum Brake Performance", Journal of Automotive Engineering, v4 n3 (Apr 1973).

by D. Fitzgeorge; A. Rowlands
Publ: Journal of Automotive Engineering v4 n5 p26-9 (Oct 1973)
1973
Availability: See serial citation

HS-014 472

CONTROL OF HYDRAULIC TRANSMISSIONS

When considering the technical aspects and functional requirements of hydraulic transmissions, in a vehicle application, attention must be given to environment, application, installation and operation. A design exercise is developed showing a view of the transmission merging into an overall picture of system analysis and assessment. Coherent values to the design exercise are assigned in value engineering judgement and systems ratings. The transmission has a low system value compared with the hydraulic system, which includes the materials handling function and the ergonomic system, which includes all controls driver position and visibility. The practical side of the ergonomic function is related to the control/transmission relationship, with particular regard to hydraulic transmission. Control functions of the torque converter transmission and the hydrostatic transmission may involve swash angle, rocker pedal or engine throttle controls. The new concept of integrated hydrostatic transmission and optimal control systems has been designed specifically for the mobile equipment market and will provide liberal opportunities for advancing economic control.

by K. Cook
Publ: Journal of Automotive Engineering v4 n4 p8-11 (Aug 1973)
1973
Availability: See serial citation

HS-014 473

LOCATION OF BEARING OIL FEEDS

A short appraisal is given of analytical and practical factors governing the location of oil supply drillings in the crankshaft and bearings, and an optimized position for crankpin drillings feeding connecting rod bearing is suggested. Methods and problems related to the bearing oil feed arrangements are described. It is concluded that the oil film extent method of selecting oil drilling positions is the most rational analytical method available but it has to be used with due consideration of other practical mechanical factors.

by J. P. Pirault
Publ: Journal of Automotive Engineering v4 n4 p23-7 (Aug 1973)
1973 ; 2refs
Availability: See serial citation

HS-014 474

NORTH CAROLINA 1973 ACCIDENT DATA DICTIONARY

A segment of the National Driving Center's data acquisition and analysis program describing North Carolina accident records for 1973 is described in the form of an accident dictionary reviewing the 112 accident variables recorded for each accident. The index itemize the file variables and their location in the dictionary. Within the dictionary, each variable is displayed with the applicable code values and associated frequency distributions. Users will find the variable frequency distributions helpful in answering questions and identifying problems.

Duke Univ., Durham, N. C. National Driving Center
1974 ; 65p
Availability: Corporate author

HS-014 475

THE NDC NORTH CAROLINA DRIVER LICENSE CODEBOOK

This document represents one segment of the National Driving Center's data acquisition and analysis program describing the driver license records. Some 121 driver record variables recorded as of January 1, 1974 are described. An index itemize the file variables and their location in the codebook. Within the codebook each variable is displayed with the applicable code values and associated driver license records in this data file.

Duke Univ., Durham, N. C. National Driving Center
1974 ; 67p
Availability: Corporate author

HS-014 476

THE NDC DRIVER MEDICAL DATA CODEBOOK

Part of the National Driving Center's data acquisition and analysis program is presented describing those driver license records from the entire driver population which contain medical data. Some 143 driver record variables for 24,992 drivers are reported. An index itemizes the file variables and their lo-

cation in the codebook. Within the codebook each variable is displayed with the applicable code values and associated driver license records in the data file.

Duke Univ., Durham, N. C. National Driving Center
1974 ; 76p
Availability: Corporate author

HS-014 477

NAS REPORT ON TECHNOLOGICAL FEASIBILITY OF 1975-76 MOTOR VEHICLE EMISSION STANDARDS. FINAL COMMITTEE REPORT

This report summarizes the work and findings of the Committee on Motor Vehicle Emissions in accord with the provisions of Sec.6 of Public Law 91-604, the Clean Air Amendments of 1970. It constitutes a description of the "technological feasibility" on the part of the automobile and related industries, of achieving the automotive emissions control standards established by the Act. Technological feasibility was defined to mean that an emissions control system capable of meeting the standards set for the three major pollutants can be developed, designed, produced in large numbers, and maintained in service, all at reasonable cost. By these criteria, the Committee's analysis indicates that achievement of the 1975 standards may be technologically feasible and that achievement of the 1976 standards is likely but may not be attainable on the established schedule.

National Academy of Sciences--National Res. Council, Washington, D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 858 ; 1973 ; 156p
Rept. for Jan 1972-Feb 1973.
Availability: NTIS

HS-014 478

AN EVALUATION OF ALTERNATIVE POWER SOURCES FOR LOW-EMISSION AUTOMOBILES. PANEL REPORT

Several near- and long-term alternative power systems are evaluated including diesel, gas turbine Rankine cycle, and Stirling engines. Electric vehicles and alternative fuels are also studied. Various aspects of each engine-system are considered, such as emissions, fuel economy, noise, cost, size and weight, produceability, and the driveability. The lead time necessary to begin limited and mass production of each system is examined. Also included is a discussion of vehicle air pollution reduction by methods other than engine development, such as changes in the duty cycle required of a given car and societal changes that will demand fewer car-miles.

National Academy of Sciences--National Res. Council, Washington, D.C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 859 ; 1973 ; 161p 162 refs
NAS report on Technological Feasibility of 1975-76 Motor Vehicle Emission Standards.
Availability: NTIS

HS-014 479

EVALUATION OF CATALYST AS AUTOMOTIVE EXHAUST TREATMENT DEVICES. PANEL REPORT

The availability of catalysts for oxidation and NOx reductio with sufficient activity and stability, the causes of aging, ar the interaction of catalysts with hardware modifications a discussed. The raw material availability, manufacturing ar maintenance problems, and the toxicology of debris are al examined. Findings include: of the potential catalyst convert configurations that have been examined, none was clearly o timum; variability in test results poses serious problems in t study of the rate of catalyst deactivation and of the effects poisons; dangers to catalysts or their performance such temperature extremes, gas composition, and gas flow rate ma be avoided by such measures as proper catalyst bed locatio or by-passing, feedback to fuel injection or carburetor, ar proper catalyst bed design; except for noble metals, no ra material supply problems appear; and techniques can developed to avoid catalyst toxicity hazards to humans.

National Academy of Sciences--National Res. Council, Washington D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 860 ; 1973 ; 85p 78refs
NAS rept. on Technological Feasibility of 1975-76 Motor Vehicle Emission Standards.
Availability: NTIS

HS-014 480

A CRITIQUE OF THE 1975 FEDERAL AUTOMOBIL EMISSION STANDARD FOR CARBON MONOXIDE. PANEL REPORT

The basis for the Federal motor vehicle carbon monoxi emission standard for 1975 and later model year vehicles is e amined by the Panel of Emissions Standards. The measur ment of ambient carbon monoxide (CO) levels, the harmful e fects of CO on animals, plants, and humans, the forms ar use of air quality models, growth factors in vehicle populatio and methods of calculation of emission standards are studie The heightened effects of CO on individuals with cardiac pulmonary impairment or on heavy smokers are examine along with effects of varying degrees and durations of exp sure. The computation of total CO emissions from light-du vehicles with particular attention to age of vehicle is shown.

National Academy of Sciences--National Res. Council, Washington, D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 861 ; 1973 ; 68p 44refs
NAS rept. on Technological Feasibility of 1975-76 Motor Vehicle Emission Standards.
Availability: NTIS

HS-014 481

GETTING PERFORMANCE WITHOUT SACRIFICIN ECONOMY OR EMISSIONS CONTROL IN A HEAV DUTY LPG ENGINE

Limited route service experience with a commercial 637 co version of a gasoline engine indicated both its potential a the need for its optimization in order to take advantage of t unique characteristics of liquefied petroleum gas fuels. An e

tion relationships, was conducted, leading to substantial improvement in fuel economy without depreciation of engine power. Cylinder head redesign by the engine manufacturer permitted lean mixture operation that reduced exhaust emission to levels calculated to conform to the 1973 federal standards and 1973-74 California Air Resources Board requirements for heavy-duty engines. The principal conclusion of this study was that a modern design and optimized LPG engine shows sufficient promise in power performance and fuel economy to warrant further route service testing in urban bus or truck fleets.

by R. A. Mengelkamp; R. E. Linnard
Phillips Petroleum Co., Bartlesville, Okla.
Rept. No. SAE-730803 ; 1973 ; 16p 9 refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 482

A CRITIQUE OF THE 1975-1976 FEDERAL AUTOMOBILE EMISSION STANDARDS FOR HYDROCARBONS and oxides of nitrogen. panel report

The basis for the Federal Motor Vehicle Emission standards for hydrocarbons (HC) and oxides of nitrogen (NOx) for 1975 and later model year vehicles is examined by the NAS Panels on Emission Standards and Atmospheric Chemistry. The relationship between HC and NOx and oxidant formation, air quality levels, emission sources, growth factors, and computation of emission standards are discussed. A review points out some incomplete aspects of the report, such as heavy dependence on the results of one smog chamber study, and on the use of downtown Los Angeles as the reference point for HC. Appendices are included on photochemical reactions, equivalency between different averaging times, and quantification of non-methane hydrocarbons, and NOx.

National Academy of Sciences--National Res. Council, Washington, D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 863 ; 1973 ; 78p refs
NAS rept. on Technological Feasibility of 1975-76 Motor Vehcile Emission Standards. Includes a review of the rept. by H. S. Johnston.
Availability: NTIS

HS-014 483

MANUFACTURABILITY AND COSTS OF PROPOSED LOW-EMISSION AUTOMOTIVE ENGINE SYSTEMS. PANEL REPORT

The status of General Motors, Ford, Chrysler, and American Motors' catalyst produciton plans for 1975-76 emission control systems are examined. The potential production status of Wankel, diesel, and stratified charge engines is also considered. An estimated resource impact study of the 1976 emission control systems is included. The supplementary report presents a revised implementation plan for emission systems on 1976 passenger cars. A summary of the total costs to customers including capital equipment costs, maintenance costs, fuel penalty costs, and the vehicle sticker price values for each new configuration is included. These costs are related to a 1970 car configuration baseline.

National Academy of Sciences--National Res. Council, Washington, D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 864 ; 1973 ; 81p
NAS rept. on Technological Feasibility of 1975-76 Motor Vehicle Emission Standards. Includes supplementary rept. by L. H. Lindgren.
Availability: NTIS

HS-014 484

FEASIBILITY OF MEETING THE 1975-1976 EXHAUST EMISSION STANDARDS IN ACTUAL USE. PANEL REPORT

In this feasibility study, elements of the total testing and maintenance sequence and testing and maintenance methods were considered. Factors affecting feasibility were: durability of probable control systems; deterioration of adjustments and components; effects of fuels and lubricants; adequacy of the present service industry; adequacy of replacement parts supply; effects of untreated exhaust; problems of enforcing proper maintenance; maintenance costs; and possible engineering changes, including noncatalytic systems. It was concluded that: proposed 1975-1976 vehicles will not meet emission standards in actual use; mandatory maintenance is required to achieve maximum benefit from new systems, but will not ensure meeting the standards; there is no feasible method to ensure that proposed 1975-76 cars meet the standards in actual use; maintenance based on an improved service industry is the foundation of any system for achieving maximum benefit from proposed 1975-76 or alternative control systems. The enclosed minority report concludes that a program of required maintenance is necessary to meet standards in use, and the existing service industry cannot meet this required maintenance program.

National Academy of Sciences--National Res. Council, Washington, D. C. Com. on Motor Vehicle Emissions
Contract EPA-68-01-0402
Rept. No. PB-224 865 ; 1973 ; 257p 90refs
NAS rept. on Technological Feasibility of 1975-76 Motor Vehicle Emission Standards. Includes a minority rept. by M. F. Chew.
Availability: NTIS

HS-014 485

PHOTOMETRIC DATA VARIABILITY OF AUTOMOTIVE LIGHTING COMPONENTS. FINAL REPORT

Four automotive lighting components were tested in three commercial testing laboratories to estimate the degree of photometric data repeatability and reproducibility. The laboratories used the photometric testing techniques required by Federal Motor Vehicle Safety Standard No 108. The precision of this test method was placed in a range of about 10% coefficient of variation, but this value should be considered more as

an indication of existing conditions than as a predictive parameter.

by B. G. Simson; J. Mandel
National Hwy. Traf. Safety Administration, Washington, D.C.; National Bureau of Standards, Washington, D. C.
Rept. No. NBS-TN-821 ; 1974 ; 15p 4refs
Availability: GPO $0.60

HS-014 486

BUCKLE UP--THE SMART THING TO DO

Public acceptance and use of seat belts and problems associated with acceptance are discussed. Evidence is cited of the life saving potential of safety belt usage, and the engineering approach ot restraint system design is described. Attempts at educating the public and legislative approaches for mandatory seat belt usage are reviewed. Current requirements in several states are noted, and reasons given for not wearing seat belt are shown to be invalid. Evidence of public apathy is discussed along with seat belt usage requirements of employers operating fleets of vehicles. Further consideration is given to costs, effectiveness, and benefits.

by V. J. Perini, Jr.
Publ: Highway User Quarterly p18-24 (Winter 1974)
1974
Availability: See serial citation

HS-014 487

IMPROVING TRAFFIC OPERATIONS AND SAFETY AT EXIT GORE AREAS

The problem of erratic maneuvers, such as backing up and stopping in the gore area, that occur frequently at freeway exit areas is examined in terms of driver motivation, remedial devices for existing sites, and design and traffic control criteria to minimize the problem at future sites. A state-of-the-art art summary is presented regarding geometric design, traffic characteristics, accidents, human factors, signing, and delineation. Nine exit sites are studied, and analyses of the patterns of the erratic maneuvers and on-site driver interviews are used to determine causative factors. The results indicate that more than one factor is usually present at any one site, and that these factors vary from site to site. The factors are generally classified as driver-related problems, information deficiencies, or geometric deficiencies. Recommendations concerning changes in traffic control measured by design criteria are given.

by J. I. Taylor; H. W. McGee
Pennsylvania State Univ., University Park
Rept. No. NCHRP-145 ; 1973 ; 130p 58refs
Prepared for the Hwy. Res. Board, National Res. Council, Washington, D.C. Sponsored by the American Assoc. of State Hwy. Official in cooperation with Federal Highway Administration.
Availability: Highway Research Board $6.00

HS-014 488

HIGHWAY NOISE. A FIELD EVALUATION OF TRAFFIC NOISE REDUCTION MEASURES

Four basic highway noise reduction constructions are considered: roadside barriers, elevated highway sections, depressed highway sections, and roadside structures. Six test sites in California, Minnesota, and Michigan were studied as to acoustic characteristics and the contribution of traffic and environmental parameters to the overall noise reduction characteristics of each highway geometry. Noise data were reduced statistically, and were compared and assessed with data predicted by a Design Guide which sets forth systematic procedures for the calculation of highway noise levels. The procedures were accordingly modified, for all four highway configurations, and the modifications are presented in the form of new noise reduction calculation procedures for inclusion in the Design Guide.

by B. A. Kugler; A. G. Piersol
Bolt, Beranek and Newman, Canoga Park, Calif.
Rept. No. NCHRP-144 ; 1973 ; 90p 10refs
Prepared for the Hwy. Res. Board, National Res. Council, Washington, D. C. Sponsored by the American Assoc. of State Hwy. Officials in cooperation with Federal Highway Administration.
Availability: Highway Research Board, $4.40

HS-014 489

BUS USE OF HIGHWAYS. STATE OF THE ART

The experiences of more than 200 bus priority treatments in the United States and elsewhere are reviewed in a state-of-the-art study of bus use of highways. Treatments are grouped into three broad categories: those relating to freeways, arterials, and terminals. Significant types and examples of each are summarized; most consist of reserved bus lanes on downtown city streets. Dimensions of bus are reviewed with focus on the heavy peak-hour use. Contemporary practices are cited, revealing: ability to schedule busways for construction by stages; the value of clearly identifiable busways; development costs below those of rail transit; fringe parking importance; freeway suitability or unsuitability; limited number of existing arterial bus lanes; the need for curbside bus lanes; operating costs. Planning and design considerations are included.

by H. S. Levinson; W. F. Hoey; D. B. Sanders; F. H. Wynn Smith (Wilbur) and Associates, New Haven, Conn.
Rept. No. NCHRP-143 ; 1973 ; 416p refs
Prepared for the Hwy. Res. Board, National Res. Council, Washington, D. C. Sponsored by the American Assoc. of State Hwy. Officials in cooperation with Federal Highway Administration.
Availability: Highway Research Board $16.00

HS-014 491

VIEW: A HEADLIGHT RESEARCH PROGRAM FOR PRODUCING AN ILLUMINATION MAP ON THE VERTICAL PLANE ABOUT THE EYE (OR SOME OTHER) AXIS.

The VIEW program generates a map of the illumination falling on a vertical plane and on various target surfaces within the plane. It consists of two mainline programs: one computing the

plot for each mapping. Various grid surfaces produced by the programs are described, along with the basic road geometry and the calculation of the illumination on the vertical plane, and an analysis of the structure of the programs. Program implementation is also discussed. Appendices are included which present the flow charts and source listings for the VIEW program modules and a sample execution of the programs. The programs are written in Fortran for the IBM 360/67 TSS computer.

by A. L. Harrison
National Aeronautical Establishment, Ottawa, Ont. (Canada)
Rept. No. LTR-ST.608 ; 1973 ; 149p 3 refs
Availability: National Research Council, Canada, Ottawa, Ont.

HS-014 492

ACCIDENT COSTS: SOME ESTIMATES FOR USE IN ENGINEERING-ECONOMY STUDIES

A procedure for estimating accident costs in devised, based on cost data developed for several state highway departments. The overall approach is to generate weighed averages for the costs of accidents in which the estimates from previous studies provide the direct cost input and the 1969 Texas accident experience provides the weights to be assigned to these costs. Direct costs include property damages, medical costs, legal and court fees, values for the loss of work time and vehicle use, and damages awarded in excess of costs. An involvement is that portion of an accident relating to a single vehicle and the death, injury, or property damage associated with it. Using the involvement as the basic statistical unit, the data are cross-classified by various combinations of accident severity, vehicle type and accident type. The cost components are adjusted by price index inflators, and a mean involvement cost is calculated. The present value of expected future earnings is estimated for involvements where persons were fatally injured. An estimate for the accident cost is obtained by combining the appropriate direct cost for the vehicles involved with the present value of future earnings lost due to fatalities occurring in the accident.

by D. Burke; W. F. McFarland
Publ: Highway Research Record n467 p66-74 (1973)
1973 ; 14refs
Sponsored by the HRB Committee on Application of Economic Analysis to Transportation Problems, the Texas Hwy. Department, and the Federal Hwy. Administration.
Availability: See serial citation

HS-014 493

AIR POLLUTION: IMPLICATIONS FOR TRANSPORTATION PLANNING

The need to integrate air quality considerations in to the long-range transportation planning process is discussed. Eight recommendations for doing so are given by using illustrations from the Washington, D. C. metropolitan area: Because air quality is a regional problem, solutions must be sought and implemented on regional and local scales, the kind of solution will vary depending on the time frame considered, the interaction between transportation and land use must be considered fully, central area parking policy should become an integral part of the transportation planning process, the benefits of alternative actions should be stated clearly and the impacts to private and public groups estimated, alternative land use and transportation policies should be examined, a planning process responsive to evaluating alternative courses of action is required, and continuing process improvements, monitoring, and feedback are essential.

by G. V. Wickstrom
Publ: Highway Research Record n465 p46-54 (1973)
1973 ; 1ref
Sponsored by the HRB Advisory Committee on Hwys. and Air Quality.
Availability: See serial citation

HS-014 494

COMPUTER MODEL FOR OPTIMAL FREEWAY ON-RAMP CONTROL

Regulating input volume to a freeway system through ramp metering, or ramp closure, maintains traffic flow at an efficient level and improves overall system performance. This paper describes the development of a computer program, LINCON, that can determine the desired fixed-time metering rates for a group of on-ramps to be controlled. The linear programming technique is used to formulate a decision model that is integrated with a previously developed deterministic freeway simulation model, FREEQ, to become a ramp-control model, RAMPCON. To take into consideration the effect of traffic diversion under control the decision model was formulated in such a way that, at each on-ramp, the trips with shorter freeway travel distances could divert proportionally more than the trips with longer freeway travel distances. Two objective functions, maximizing total vehicular input and maximizing total freeway vehicle-miles of travel, are considered. The program user has the option of choosing either objective.

by J. J. Wang; A. D. May
Publ: Highway Research Record n469 p16-25 (1973)
1973 ; 9refs
Sponsored by the HRB Committee on Freeway Operations.
Availability: See serial citation

HS-014 500

RAMP CONTROL TO RELIEVE FREEWAY CONGESTION CAUSED BY TRAFFIC DISTURBANCES

A class of traffic-responsive ramp control algorithms for adjusting ramp volumes (e.g., congestion resulting from lane blockages) is described. A large number of traffic-responsive ramp control plans are considered. Each plan is evaluated in terms of freeway service (vehicle-miles) and delay (vehicle-hours) over a fixed control period by simulating the response of traffic to a lane blockage on a macroscopic model of freeway traffic. The result of the analysis is a set of ramp control plans, each yielding minimum delay for a specified level of freeway service. The performance measures associated with these plans are plotted against one another, yielding a trade-off curve for final selection of a ramp metering plan.

by H. J. Payne; W. S. Meisel; M. D. Teener
Publ: Highway Research Record n469 p52-64 (1973)
1973 ; 14refs
Sponsored by the HRB Com. on Freeway Operations.
Availability: See serial citation

HS-801 053

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS--DETAILED REPORTS FROM OCTOBER 1 TO DECEMBER 31, 1973

Letters of notification and other communications to dealers and their customers regarding probable defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D. C.
1974 ; 621p
Availability: NTIS

HS-801 058

FORCE AND MOMENT CHARACTERISTICS OF PASSENGER CAR TIRES. FINAL REPORT

The applicability of the Calspan Tire Force and Moment Facility to support the National Highway Traffic Safety Administration's motor vehicle safety standards program in the tire research area is assessed. The force and moment characteristics of a selected representative tire were determined over an extensive range of test conditions. Program tasks consisted of: development of a test plan and a study of the use of the facility for rating tread wear and traction; determination of instrumentation requirements and carrying out calibration; shakedown testing; and processing and interpretation of data. Documentation of these activities and the test results are presented.

by J. F. Martin
Calspan Corp., Buffalo, N. Y.
Contract DOT-HS-053-1-108
Rept. No. YD-3160-K-1 ; 1974 ; 165p 6refs
Rept. for 30 Apr 1971 - 31 Oct 1973.
Availability: NTIS

HS-801 059

THE MEASUREMENT OF TIRE PROFILES BY ANALOG/DIGITAL TECHNIQUES. FINAL REPORT

The detailed data processing and analysis of the measurement of tire profiles using a tire profilometer in an accelerated tire wear study are described. To obtain a more accurate measurement of tire wear, a system of hardware and software (profilometer) was developed which includes a laser depth gauge and read-out device, a tire/laser mounting platform and position locator, a strip-chart recorder and controller, digital converter, an incremental digital magnetic tape recorder and controller, and the computer programs to read and analyze the data. This system is applied to three tires with mixed success, but considering the newness of the digital recording and analysis technique in application to tire profile descriptions, the agreement between the digital, the analog, and the traditional plunger is encouraging.

by M. P. Jurkat
Stevens Inst. of Tech., Hoboken, N. J. Davidson Lab.
Contract DOT-HS-183-2-287
Rept. No. SIT-DL-72-1614 ; 1974 ; 35p
Availability: NTIS

HS-801 060

COMPARISON OF TIRE TREAD WEAR BETWEEN CARS AND TOWED TRAILERS. FINAL REPORT

Tests were conducted to determine if correlation could be obtained between tire wear rates experienced on automobiles and accelerated wear rates generated on towed trailers with the wheels set at a side slip angle. Fair correlation was obtained between car experience and trailers with free rolling wheels set at equal slip angle; better correlation was obtained between car experience and trailers with free rolling wheels set at appropriate slip angle so that all tires generated the same cornering force. This level of correlation was not deemed high enough to be useful as a tire wear rating system. To improve correlation, tests were conducted under a variety of conditions of combined slip and braking. These combined conditions greatly improved correlation, one of which holds significant promise and warrants further study.

by I. O. Kamm; M. P. Jurkat; T. H. Jackson; I. R. Ehrlich
Stevens Inst. of Tech., Hoboken, N. J. Davidson Lab.
Contract DOT-HS-183-2-287
Rept. No. SIT-DL-72-1628 ; 1974 ; 87p refs
Availability: NTIS

HS-801 095

APPLICATIONS OF ACCIDENT DATA ON YOUNG DRIVER RESEARCH

Accident data collection, analysis, and findings are discussed as they relate to young drivers. The report serves as an example of how several accident and related data sources can be applied to the young driver problem, both in determining the magnitude of and the reasons for the problem. Data sources include motor vehicle registration and driver licensing data, National Accident Summary file, routine police accident reports, insurance accident reports, Fatality Analysis File, bi-level investigations, other intermediate levels, and in-depth investigations. Gross accident data indicate that young drivers are overrepresented in all severities of accidents, but it is found that more accidents involving young drivers are reported than those involving older drivers. The data do not indicate however why young drivers are more involved, or have different characteristics than in older driver accidents. Recommendations are made for further research in the field.

by J. C. Fell; V. J. Esposito
National Hwy. Traf. Safety Administration, Washington, D. C.
1974 ; 35p 32refs
NHTSA Staff Rept. Prepared as part of an Organization for Economic Cooperation and Devel. RR-S8 entitled: Research On Accidents
Availability: James C. Fell, Research Institute, Office of Accident Investigation and Data Analysis, NHTSA

HS-801 097

MULTIDISCIPLINARY ACCIDENT INVESTIGATIONS. FINAL REPORT

Results of a comprehensive and systematic study of 41 motor vehicle accidents which occurred in the Fayette County, Kentucky, area are summarized. The investigation program objective were to identify collisions causes and to isolate problem areas in highway and vehicle design, and to suggest improvements. Findings are reported regarding general accident data,

and human, vehicle and environmental factors. The primary causative factors appear to be human in nature such as driver inattention and inability. In many instances the vehicle and the environment place unreasonable demands upon driver attention and abilities. Driver education as it now exists should be abandoned in favor of a new approach to driver re-education on a continuing basis, specifically addressed to the attitudinal and motivational profiles of drivers. Vehicles should be required to meet greater safety requirements and compliance with provisions of Highway Safety Program Standards should be encouraged. Case summaries are presented in an appendix. However, the reader is cautioned that the driving environment in the study area can be considered unique as compared to similar areas in other states.

by J. W. Hutchinson; R. V. Sayre; L. Downey; J. K. Ward; E. Pantzer; D. Clemons; S. Junker
Kentucky Univ., Lexington. Multidisciplinary Accident Study Team
Contract DOT-HS-201-2-321
Rept. No. 321-KY ; 1974 ; 426p 22refs
Rept. for May 72 - Jun 73.
Availability: NTIS

HS-014 490

CHANGES IN LEGAL VEHICLE WEIGHTS AND DIMENSIONS. SOME ECONOMIC EFFECTS ON HIGHWAYS

Principal factors involved in the construction, operation, and maintenance of the highway system that appear to relate to vehicle weights and dimensions are identified and evaluated for their impact on benefits and disbenefits to highway users and nonusers. Methods are assembled from the state-of-the-art that permit projection of estimated use of highway facilities by various classes of commercial vehicles, the division of motor freight among vehicle classes on principal types of highways, and estimated payloads these vehicles will transport. Consideration is given to cost estimates, service life of pavements, bridge design standards, and pavement structural weakening. The impacts on highway geometric design of vehicle size, weight, and performance characteristics are analyzed, and accident incidence rates for vehicles with different speed distributions are estimated. It is concluded that a cost-benefit analysis method can be applied as a limited decision factor within the present state of the art.

by R. E. Whiteside; T. Y. Chu; J. C. Cosby; R. L. Whitaker; R. Winfrey
Smith (Wilbur) and Associates, Columbia, S. C.
Rept. No. NCHRP-141 ; 1973 ; 194p refs
Prepared for the Hwy. Res. Board, National Res. Council, Washington D. C. Sponsored by the American Assoc. of State Hwy. Officials in cooperation with Federal Hwy. Administration.
Availability: Highway Research Board $8.40

HS-014 495

DETECTING STOPPAGE WAVES FOR FREEWAY CONTROL

An experimental warning system has been installed on the inbound control section of the Gulf Freeway as a means of alerting drivers approaching crest vertical curves of stoppages downstream of the crest. Automatic control of the warning system dictated the need to identify measurable traffic parameters that indicate the presence of a stoppage wave. An analysis is presented of selected speed and energy parameters and indicators of stoppage waves. The results demonstrate that both the speed and energy parameters perform satisfactorily. Based on the results of the investigation a digital computer control algorithm was structured for automatic control of the warning system. Recommendations are given for detector placement.

by C. L. Dudek; C. J. Messer
Publ: Highway Research Record n469 p1-15 (1973)
1973 ; 12refs
Sponsored by the HRB Committee on Freeway Operations, the Texas Hwy. Department, and the Federal Hwy. Administration.
Availability: See publications

HS-014 496

IMPLICATIONS FOR TRANSPORTATION OF NEW FEDERAL AIR POLLUTION CONTROLS

A legislative history of federal air pollution control efforts terminating with the Clean Air Amendments of 1970 provides the basis for a discussion of the implications of compliance with federal ambient air quality standards. A major implication is the need in numerous urban areas for transportation controls, control mechanisms not addressed by most of the state implementation plans submitted to the Environmental Protection Agency in January of 1972. A review of the rollback methodology used in predicting future air quality attendant with projected emission reductions is presented. Inherent data base uncertainties and basic technological and socioeconomic assumptions employed are discussed. The use of a comprehensive analysis approach for evaluating the externalities of selected implementation plan control strategies is endorsed.

by R. A. Venezia
Publ: Highway Research Record n465 p14-20 (1973)
1973 ; 3refs
Sponsored by the HRB Task Force on Hwys. and the Environment.
Availability: See publication

HS-014 497

PREDICTING MOTOR VEHICLE AIR POLLUTION CONCENTRATIONS FROM HIGHWAY NETWORK ANALYSIS

An urban diffusion model is developed that uses urban transportation planning variables, such as speeds, volumes, and distances on network links, together with readily available meterological data to forecast concentrations of carbon monoxide in the urban area. The model includes a submodel that computes carbon monoxide concentrations in urban street canyons, taking account of CO produced within the canyon as well as background CO. The model can evaluate the relative air pollution potential of alternative urban highway networks and alternative strategies for meeting air quality standards, and indicate sites for air quality monitoring stations. It has been validated in a two-year program in St. Louis and San Jose, and

will be expanded to take account of other pollutants such as oxides of nitrogen.

by A. E. Moon; F. L. Ludwig
Publ: Highway Research Record n465 p96-104 (1973)
1973 ; 9p 8 refs
Sponosred by the HRB Committee on Social, Economic and Environmental Factors of Transp. Model development was sponsored by the Coordinating Res. Council, N. Y., the Environmental Protection Agency, N. C., and Stanford Res. Inst.
Availability: See publication

HS-014 498

PREDICTION AND STABILITY OF FREEWAY GAPS AND ON-RAMP MERGING

The prediction of freeway gaps and their associated errors for single- and double-loop detectors is analyzed. Analytical expression for errors in gap prediction and speed estimation are derived and validated against experimental observation obtained from aerial photographic data and are related to different sensing pulse rates and detector locations for single- and double-loop detections. The problem of gap prediction is also related to the stability of traffic in the vicinity of an on-ramp. The effects of lane changing and variation in the speed of the individual car between the detector location and and the on-ramp merge point are also analyzed from experiemntal data. Fixed-metering strategy and gap-prediction strategy are compared, and the fixed-metering rate is determined according to the measured occupancy from the experimental data. Results indicate that the gap-prediction strategy has great application value.

by P. K. Munjal; Y. S. Hsu; R. L. Lawrence
Publ: Highway Research Record n469 p26-39 (1973)
1973 ; 18refs
Sponsored by the HRB Committee on Freeway Operations.
Availability: See publication

HS-014 499

PROVIDING FOR AIR QUALITY AND URBAN MOBILITY

The process of incorporating air quality considerations in planning, the basic relations between transportation and air pollution, techniques for achieving air quality, and the institutional difficulties of implementing transportation control techniques are discussed. The air quality problem is related to transportation with regard to vehicle emissions, direction and speed of wind, time of day, and physical barriers. Primary and secondary air quality standards established by federal and state governments are discussed and tabulated. Techniques of air quality control are grouped into programs oriented toward vehicles, traffic flow, and reduction of pollution concentration. Possible obstacles between DOT and EPA are noted. It is suggested that short-term actions aimed at ameliorating air pollution must aim at fostering communication among responsible agencies. Long-term actions require research and more analytical information.

by S. J. Bellomo
Publ: Highway Research Record n465 p1-13 (1973)
1973 ; 15refs
Sponsored by the HRB Task Force on Hwys. and the Environment.

HS-014 501

SHORT-TERM TRANSPORTATION CONTROL STRATEGIES FOR AIR POLLUTION CONTROL

Seven short-tern transportation control strategies are identified as likely candidates to provide for short-term reductions in carbon monoxide emissions for motor vehicles and attainment of primary standards for carbon monoxide for the 1975 deadline: inspection, maintenance, and retrofit; conversion to gaseous fuels; traffic flow techniques; bypassing through traffic; improvements in public transportation; motor vehicle restraints; and work schedule changes. For each candidate, the air pollution potential, the maximum feasible emission reduction, and the institutional feasibility are described. The findings are based on an EPA-sponsored study of Chicago, Denver, Los Angeles, New York, San Francisco, and Washington, D. C. Emphasis was placed on identifying transportation controls that could be available within a period of three years, realistically subject to implementation by state and county governments and institutionally and technically feasible.

by J. S. Revis
Publ: Highway Research Record n465 p21-45 (1973)
1973 ; 11refs
Sponsored by the HRB Adivisory Com. on Highways and Air Quality.
Availability: See publication

HS-014 502

STRUCTURING AN ANALYSIS OF PEDESTRIAN TRAVEL

Pedestrian characteristics and physical elements instrumental in shaping walking activity are used to develop a systematic analysis of pedestrian travel. The methodology provides a generalized supply-demand conceptualization of the problem based on pedestrian needs and accommodations (or impedances) and derives a strategy to show that the frequency of walking trips is related to the quality of the walking environment. The influential elements of the walking system are stated in terms of accommodations, such as overpasses, pedestrian tunnels, or lighting along walkways, and of impedances arising from high traffic volumes or the barriers posed by the roadways themselves. Trade-off effects between these two factors establish an index of the quality of the walking environment. Procedures for gathering field data are proposed, and graphical means of using the data to measure the impact of transportation projects on pedestrian mobility are described.

by M. J. Demetsky; D. Morris
Publ: Highway Research Record n467 p14-23 (1973)
1973 ; 7refs
Sponsored by the HRB Com. on Social, Economic and Environmental Factors of Transp.
Availability: See publication

HS-014 503

BRAKING CHARACTERISTICS OF THE RECREATIONAL SNOWMOBILE

The braking characteristics of three typical recreational snowmobiles are studied. The sensitivity of the machines to dif-

using a variable-load braking apparatus and stop-action high-speed photography, and the results are described with an empirical equation. It was determined that the most effective braking was achieved when the track was locked, and this behavior is also characterized by an empirical expression.

by J. K. H. Kho; J. A. Newman
Ottawa Univ., Ont. (Canada)
Rept. No. SAE-730783 ; 1973 ; 7p 14refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep. 1973.
Availability: SAE

HS-014 504

HYDROSTATIC MOTORS--DIRECT OR INDIRECT?

The case for hydrostatic drives in off-the-road vehicles is discussed. In the past, the tendency has been to use high-speed motors with a reduction gearbox. This suffers from the main disadvantages of size, complexity, and cost. It is shown that, in many cases, a direct-drive, slow-speed hydraulic motor (or the multilobe ball piston type) has many advantages, primarily in size, simplicity, and cost. However, to achieve the full advantages of hydrostatic drive, a truly integrated package must be used, by having the drive designed into the structure at the outset.

by D. Firth
National Engineering Lab., East Kilbride (Scotland)
Rept. No. SAE-730785 ; 1973 ; 12p 1ref
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 505

APPLICATION OF HYDROSTATIC TRANSMISSIONS TO SMALL AND MEDIUM HORSEPOWER VEHICLES

The basic power train design of hydrostatic transmissions for small and medium horsepower vehicles is described, with focus on data frequently overlooked in the initial application of these units. Component availability, general applications, efficiency versus productivity, applications guidelines, and transmission protection are discussed. It is concluded that in the short-term future, proper application of these devices should contribute to better performance, increased reliability, and high productivity in a wide variety of machines.

by J. J. Bauer
Clark Equipment Co., Gwinner, N. D. Melroe Div.
Rept. No. SAE-730786 ; 1973 ; 5p
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 506

HYDROFLUIDIC SERVOS FOR INDUSTRY

A closed-loop positioning servo using proportional hydrofluidic amplifiers and flowing hydraulic fluid to replace the numerous The hydrofluidic servo has been built in both a packaged servoactuator form and a modular form for integration with existing hydrostatic transmission pumps. Operating principles and performance of experimental units are discussed. Operation was evaluated over a 160-500 psig (11-34.5 bar) supply pressure range using fluid viscosities ranging from 220-5 cSt. It was concluded that hydrofluidic servos are practical and that their application in industry will be contingent upon the availability of off-the-shelf components.

by R. V. Burton
Honeywell, Inc., Minneapolis, Minn.
Rept. No. SAE-730787 ; 1973 ; 10p
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 507

EUROPEAN LEGISLATIVE REQUIREMENTS FOR AGRICULTURAL TRACTORS AND FARM MACHINERY

The structure and interrelationships of European standards-making organizations are outlined with particular reference to agricultural machinery. The standards being developed are becoming part of legislation in various Common Market countries. Covered are the highway code--constructional requirements, safety constructional requirements, test codes, and engineering standards. The current status of requirements for lighting, tractor cabs (including structural tests, noise, and emissions), maximum speed limits, brakes, hitches, and safety in the various countries are discussed.

by H. F. Howell
Massey-Ferguson Ltd. Coventry, Warwick (England)
Rept. No. SAE-730788 ; 1973 ; 16p
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 508

PASSENGER CAR FUEL ECONOMY--TRENDS AND INFLUENCING FACTORS

Trends and influencing factors in passenger car fuel economy are discussed. Fuel economy and consumption were calculated by a carbon balance method from HC, CO, AND CO2 emissions measured by the 1972 Federal Test Procedure. Data are derived from 4000 tests of passenger cars (1957 passenger cars to 1975 prototypes) and are presented for various model year and vehicle weight categories. Fuel economy trends are discussed on an overall sales-weighted basis for each individual weight class, and influencing factors are quantified through the use of a regression analysis. Particular emphasis is placed on the differences in fuel economy between vehicle subject to federal emission regulations and vehicles that were not. Three ways to characterize vehicle specific fuel consump-

tion are presented and discussed along with possible ways to improve economy and consumption.

by T. C. Austin; K. H. Hellman
Environmental Protection Agency, Washington, D. C.
Rept. No. SAE-730790 ; 1973 ; 37p 33refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10c13 Sep 1973.
Availability: SAE

HS-014 509

A NORTH EUROPEAN TRACTOR CAB

A farm tractor protection cab made of thin steel sheet pressings is described. The cab is designed and produced using entirely automotive-type procedures. Curved glasses and a dampening suspension of the glasses are found to be an important means of achieving a low noise level in the cab. Using the pressing technique when producing a steel cab makes it possible to give the various cab details rigidity with a minimum of material. When welded together, they make a stiff cab body giving the necessary mechanical strength. The curved surfaces, the radii, and the round forms also have a vibration-dampening effect on the entire cab construction, making it easier to design a quiet tractor cab. Mounted on a farm tractor of conventional design, the cab meets the noise rating number ISO N85.

by E. G. Ahlstrom
Volvo B.M.A.B., Eskilstuna (Sweden)
Rept. No. SAE-730792 ; 1973 ; 9p
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 510

EVALUATING HUMAN EXPOSURE TO VIBRATION

Draft standards of the International Organization for Standardization for the evaluation of human response to whole-body vibration in the range of 1-80 Hz are reviewed and evaluated. The work leading up to their formulation and their areas of application are examined. The guidelines provide a current consensus as to the limits of acceptable human exposure to whole-body vibration in vehicles, buildings, and workplaces, according to selected criteria: comfort, working efficiency, and protection from injury. The limits are expressed in terms of acceleration as a function of directions and frequency of vibration and daily duration of exposure. The need for further field and laboratory research to provide better supporting data for standarizing limits of human exposure to vibration is also mentioned.

by J. C. Guignard
Dayton Univ., Ohio. Research Inst.
Rept. No. SAE-730793 ; 1973 ; 6p 12refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 511

SOLID CONTAMINANT PROFILES FOR HYDRAULIC FLUIDS

A method of describing the level of solid contaminants in a hydraulic fluid is presented. Two parameters found important are number of particles and particle size. In examining hydraulic components as to type and usage, two areas of particle size are of special significance, 5 and 15 micrometers. By counting all particles in a fluid sample above 5 and also above 15 micrometers, two indexes are given from which a contaminant profile is derived. It is shown that this profile is useful in predicting the performance of specific components with the fluid.

by P. J. Wilson
Sperry Vickers European Group, Cobham, Surrey (England)
Rept. No. SAE-730797 ; 1973 ; 7p 1ref
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 512

SELECTION OF PUMPS AND FILTER SYSTEMS BASED ON OIL CONTAMINANT LEVELS IN AN AGRICULTURAL TRACTOR

The use of the Oklahoma State University Pump Contaminant Sensitivity Test, OSU-F2 Multi-pass Filter Performance Test, and knowledge of hydraulic fluid contamination levels in field tests are discussed as effective tools in developing a reliable hydraulic system for a farm tractor. Goals for an improved filter system include providing as much filter capacity as economically possible, increasing the filter flow rate, and isolating the pumps from the sources of contaminants. These modifications corrected the problems: brake friction surfaces which generated less contaminant; a pump with greater contaminant tolerances; and an improved filtration system.

by J. W. O'Connor
Allis-Chalmers Corp., Milwaukee, Wis.
Rept. No. SAE-730798 ; 1973 ; 6p 5refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 513

SPECIAL PERFORMANCE OF TRANSMISSION PARTS BY SHOT PEENING

The value of shot peening in reducing production costs with high volume is illustrated. Its potential as a means of reducing part size by way of increased fatigue strength can result in saving material to the extent of hundreds of dollars per day. The significance of the distribution of residual stresses within the shot-peened part is discussed, and theories are presented in an attempt to explain some of the effects of shot peening. The economics of efficient operation of peening equipment are

discussed, and suggestions are given to minimize operational costs.

by J. C. Straub
Wheelabrator-Frye, Inc., New York
Rept. No. SAE-730800 ; 1973 ; 22p 9refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10c13 Sep 1973.
Availability: SAE

HS-014 514

GAS FROM COAL AS AN AUTOMOTIVE FUEL

The characteristics of simulated coal gas as an automotive fuel in a multicylinder engine in a standard and high compression ratio engine configuration are examined. While using simulated coal gas fuel, increasing the engine compression ratio improved the fuel economy and vehicle performance but increased hydrocarbon emissions by 40%. An oxidizing catalyst used with the simulated coal gas fuel resulted in elimination of all but trace amounts of carbon monoxide and reactive hydrocarbons in the exhaust. Spark gap geometry and firing voltage were varied and within the range tested had little effect on vehicle performance and emissions using simulated coal gas fuel.

by J. R. Allsup
Bureau of Mines, Washington, D. C.
Rept. No. SAE-730802 ; 1973 ; 8p 12refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 515

THE IMPORTANCE OF GASEOUS FUELED VEHICLES

The use of liquified petroleum gas and natural gas is evaluated. In an attempt to offset misleading assumptions and implications, gaseous fueled vehicles are analyzed with particular attention to: emission effects, air basins needing gas-fueled vehicles, fuel availability, costs, reliability, and disadvantages. It is concluded that compared to clean 1975 gasoline vehicles, gaseous-fueled vehicles will be cheaper and more reliable to run. Disadvantages include limited distribution of fuels, limited fuel-carrying capacity, regulatory limitations, and a need for more highly developed hardware. There is a small but important market where conversion will be profitable for the owner and community.

by F. A. Jennings; W. R. Studhalter
Environmental Technology and Economy, Woodland Hills, Calif.
Rept. No. SAE-730804 ; 1973 ; 10p 15refs
Presented at the National Combined Farm, Construction and Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 516

EXHAUST PORT SHAPES FOR SOUND AND POWER

A theoretical analysis is presented that predicts significant reductions in exhaust pulse amplitudes and exhaust noise levels by varying the shape of the exhaust port in a spark-ignited 2-cycle engine. Verification and correlation with experimental results are also given.

by M. B. Johnston
Homelite, Port Chester, N. Y.
Rept. No. SAE-730815 ; 1973 ; 11p 2refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 517

TESTING OF TRANSMISSIONS

Functional tests of off-road vehicle transmissions at the end of a production line under conditions simulating those of actual use are discussed. Pallets are used to obtain high utilization of the testing equipment. A check is made of such factors as regulator pressure, lube pressure, drag losses, gear noise, and torque under specific conditions. The testing cycle, methods employed, and readings obtained are described.

by V. G. Converse, 3rd.
Scans Associates, Inc., Livonia, Mich.
Rept. No. SAE-730818 ; 1973 ; 9p
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 518

PUNCHED TAPE CONTROL OF POWER SHIFT TRANSMISSION TEST STANDS

A punched tape program used to control power shift transmission test stands operating as single or multiple units is described. Any desired shift sequence (sequence or skip shifting) is available with no concern for rate of shift level movement, accuracy of detent positions, etc. Transmission shifting is accomplished by using electric solenoid valves to control the shift valves. Test unit design and construction, the test controller, test cycle design, test results, laboratory-field correlation, engine, costs, and test stand deficiencies are covered. This system provides test flexibility, rapid data acquisition, engine life data, and minimum equipment investment.

by R. E. Haight
Deere and Co., Moline, Ill.
Rept. No. SAE-730819 ; 1973 ; 5p 2refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meeting, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-801 081

FRONTAL AND SIDE IMPACT CRASHWORTHINESS--COMPACT CARS. FINAL REPORT

Techniques for improving front and side vehicle crashworthiness were developed and applied to a production compact vehicle, the 1973 AMC Hornet. General vehicle configuration was maintained as was production feasibility. Total weight increase for all modifications was 104 lbs. Five baseline, three subsystem, and 15 system vehicle crash tests were conducted. Modified vehicles demonstrated substantial improvement over baseline vehicle performance, Mathematical models for estimating dynamic response characteristics of vehicles involved in a variety of crash conditions including flat barrier, oblique barrier, pole and vehicle-to-vehicle impacts were developed. Computer simulations were conducted and results were compared with crash test results.

by W. J. Wingenbach; R. E. Lagerquist
AMF, Inc., Goleta, Calif. Advanced Systems Lab.
Contract DOT-HS-257-2-461
1974 ; 211p
Rept. for Jun 1972-Dec 1973.
Availability: NTIS

HS-801 128

VEHICLE FRONT END STRUCTURE CRASH EVALUATION PROGRAM. VOL. 1. FINAL SUMMARY REPORT

by L. M. Shaw; A. D. Harper; R. L. Anderson
Ultrasystems, Inc., Phoenix, Ariz. Dynamic Science Div.
Contract DOT-HS-046-2-486
Rept. No. 2310-73-160-Vol-1 ; 1974 ; 42p
Rept. for Jul 1972-Dec 1973. For abstract and search terms, see HS-801 129 and HS-801 130.
Availability: NTIS

HS-801 129

VEHICLE FRONT END STRUCTURE CRASH EVALUATION PROGRAM. VOL. 2. FINAL TECHNICAL REPORT

Results of a research program conducted to determine the crash response characteristics of two front end structure system are presented. Computer simulations of each structure and crash environment were conducted using an existing computer crash simulation program. The two front end structures, a ramped fixed-force system and a variable stroke velocity-sensitive system, were incorporated into bogey vehicles which were crashed into a rigid barrier, a variable rigidity barrier, and production vehicle front and side structures. The test results provided data by which computer simulation of the crash conditions was verified, providing a high degree of confidence in analytical representation. The empirical data were extended to other crash environments using the computer simulation techniques. Parametric studies were conducted to study the effects of bumper weight and structural stiffness on vehicle and structure system responses.

by L. M. Shaw; A. D. Harper; R. L. Anderson
Ultrasystems, Inc., Phoenix, Ariz. Dynamic Science Div.
Contract DOT-HS-046-2-486
Rept. No. 2310-73-160-Vol-2 ; 1974 ; 267p 9 refs
Rept. for Jul 1972-Dec 1973. Vol. 1 is HS-801 128; vol 3 is HS-801 130.
Availability: NTIS

HS-801 130

VEHICLE FRONT END STRUCTURE CRASH EVALUATION PROGRAM. VOL. 3. APPENDICES. FINAL REPORT

Appendices to a research study on the crash response characteristics of two front end structure systems are presented. Details of the test procedures for bogey vehicle mounted test front end structures impacting a rigid barrier, a variable rigidity barrier, and front and side structures of production vehicles are given. A sequential description of the tests conducted with actual and computer simulation results is presented. Results are both photographed and tabulated. FMCCM computer program input data sheets and computer listing for operation on a Univac 1108 computer are included.

by L. M. Shaw; A. D. Harper; R. L. Anderson
Ultrasystems, Inc., Phoenix, Ariz. Dynamic Science Div.
Contract DOT-HS-046-2-486
Rept. No. 2310-73-160-Vol-3 ; 1974 ; 552p
Rept. for Jul 1972-Dec 1973. Vol. 1 is HS-801 128; vol. 2 is HS-801 129. Includes synopis of Technical Advisory Services for Vehicle Front-end Structures Crash Test Program, by J. T. Herridge, W. E. Gawthrop, and R. K. Mitchell.
Availability: NTIS

HS-014 519

PROCEEDINGS OF 17TH CONFERENCE OF THE AMERICAN ASSOCIATION FOR AUTOMOTIVE MEDICINE, OKLAHOMA CITY, OKLAHOMA, NOVEMBER 14-17, 1973

Medical aspects of the use of motor vehicles are covered in the proceedings. Traffic safety problems are identified and evaluated including those related to the motor carrier transportation of hazardous materials, snowmobiling, medical screening of driver license applicants, and visual factors related to crashes. Motor vehicle safety restraints including seat belts and inflatables are evaluated and compared. The results and types of accidents and related injuries and fatalities are also presented and include injuries resulting from automobile accidents, pedestrian/vehicle impacts, motorcycle collisions, and alcohol usage. Medical problems such as the care of trauma patients, and ambulance service are analyzed.

American Assoc. for Automotive Medicine, Lake Bluff, Ill.
1973 ; 525p refs
Includes HS-014 520--HS-014 550. Sponsored by the Univ. of Okla. Health Sciences Center; FAA; Okla. State Medical Assoc.; Okla. State Dept. of Public Safety; and Okla. State Dept. of Health.
Availability: Corporate author

HS-014 520

A PILOT PROGRAM IN REGIONAL PROBLEM IDENTIFICATION AND COUNTERMEASURE DESIGN AND EVALUATION

Steps and procedures used in applying a systems approach to the highway crash problem of Oakland County, Michigan, a representative metropolitan area county, are described. Procedures by which citizen task forces utilized computerized crash data, surveys, and other instruments to identify and prioritize traffic safety problems are summarized. The steps in the implementation of a comprehensive traffic law enforcement program are discussed, including public opinion studies, surveys of police traffic services, traffic court operations, and public education programs. The principal activities and accomplishments of this national demonstration program are reviewed.

by B. B. Madsen
Traffic Improvement Assoc. of Oakland County, Bloomfield Hills, Mich.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p1-6
1973
Availability: In HS-014 519

HS-014 521

DYNAMIC TESTING OF A PROTOTYPE AIR BAG WITH HUMAN VOLUNTEERS SERUM ENZYME DETERMINATIONS, OBSERVED TRAUMA AND SUBJECTIVE RESPONSE DESCRIPTIONS

A prototype air bag restraint was evaluated using human volunteers at barrier crash environmental profiles of 10 to 22 g in 2 g increments, and barrier impact velocities of 24 kph to 48 kph. Each subject was seated in the right front passenger position. Serum enzyme levels of creatine phosphokinase, lactic dehydrogenase, and serum glumatic oxalacetic transaminase were performed; blood samples were drawn pre- and post-impact. Peak vector sum accelerations of the chests ranged from 44.1 to 70.4 g during impact and from 17.3 to 50.5 g during rebound. There were no significant differences in the enzyme levels over time for the 10 subjects studied. Trauma observed during the entire investigation was not exceptional, consisting of erythema, abrasions, contusion, and blister. Subjective responses were primarily stinging of the nose and face, headaches, and neck soreness. Some abdomen and knee-thigh complaints were recorded.

by C. R. Greer
Baptist Memorial Hosp., Memphis, Tenn.
Contract DOT-HS-017-1-017
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p21-30
1973 ; 12refs
Study was conducted by the Impact Branch, Biodynamics and Bionics Div., 6570th Aerospace Medical Res. Lab., Wright Patterson AFB, Ohio, at the Impact Branch Operating Location, Holloman AFB, N. Mex.
Availability: In HS-014 519

HS-014 522

FULLY PASSIVE RESTRAINT SYSTEMS: ALTERNATIVES TO INFLATABLE SYSTEMS

Patent, literature, and manufacturer surveys were conducted to collect data indicative of alternate passive restraint systems other than inflatables. Results provided 50 unique types of devices and concepts, classified into seven categories: transparent shields, nets, cushions, arms and barriers, seat belts, integrated seat designs, and blankets. These were examined to select the concept(s) having the greatest potential to equal or exceed the life-saving potential of the inflatable restraint system. Preliminary criteria were loading patterns, practicality, and user acceptance. At 25 g half-sine pulse of 30 mph velocity change created an intolerable response for a 50th percentile dummy contained in a barrier seat concept, but acceptable response for a passive seat belt concept at 30 and 40 mph. It is concluded that a passive seat belt system is the best.

by N. S. Phillips
Beta Industries, Inc., Dayton, Ohio
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p31-51
1973 ; 5refs
Availability: In HS-014 519

HS-014 523

THE AUSTRALIAN EXPERIENCE

Compulsory seat belt usage in Australia is reviewed from the 1970 legislative enactment to current practices and effectiveness. Reasons for the legislation centered on the steadily increasing injury and fatality rates. In the first year under the new law, fatalities were reduced 20 percent and serious injuries approximately 30 percent. Investigations in 1972 on the Australian situation are summarized.

by C. H. Pulley
American Safety Belt Council, Inc., New Rochelle, N. Y.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p52
1973
Availability: In HS-014 519

HS-014 524

THE EFFECT OF MANDATORY SEAT BELT USE IN NEW SOUTH WALES, AUSTRALIA

Public reaction and attitudes toward seat belts and the Australian law requiring their usage are surveyed and the results are compared with a similar study performed before the law was introduced. The main change has been that people now perceive the benefits of seat belts to be higher than before. One of these benefits is the avoidance of a fine for non-compliance; the level of enforcement activity is therefore relevant, and the extent to which social pressures will take over from

legal pressures is an important issue. It is suggested that seat belts must be made more comfortable and convenient to use.

by J. M. Henderson; K. Freedman
New South Wales. Dept. of Motor Transport, Sidney (Australia)
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p53-69
1973 ; 5refs
Availability: In HS-014 519

HS-014 525

A STUDY OF THE DYNAMICS OF PEDESTRIANS AND GENERALLY UNSUPPORTED TRANSIT SYSTEM OCCUPANTS IN SELECTED ACCIDENT MODES

A pedestrian/vehicle impact problem study indicated that one of the factors responsible for the relative lack of experimental effort in the field was a basic lack of an experiemntal methodology which could treat this accident mode in a highly controllable/repeatable manner. An experimental test methodology was developed which could utilize actual or stylized vehicle front end structures mounted on a Hyge sled to impact pedestrians simulated by instrumented anthropomorphic adult and child dummies. Results from 22 shots suggest that a viable methodology has been developed, that work on vehicle profile modifications and/or energy absorbing schemes should be fruitful, and that the same basic test methodology should prove useful in addressing the problem of crashes involving generally unsupported occupants such as standees riding in a mass transit vehicle.

by J. T. Herridge; H. B. Pritz
Battelle Columbus Labs., Ohio
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p70-86
1973 ; 44refs
Availability: In ths-014 519

HS-014 526

INJURY CAUSATION IN ROLLOVER ACCIDENTS

A study of 266 rollover crashes with 377 front seat occupants indicates that 62% of the vehicles meet the intent of Federal Motor Vehicle Safety Standard 216. Half of the occupants had minor or no reported injury; 30% of the non-restrained occupants were ejected during rollovers and 20% had critical or fatal injuries whereas belted occupants sustained critical or fatal injuries in 6% of cases. Of those ejected, about 50% were killed. Ejection is independent of roof crush. Contacts producing injury are distributed throughout the various contact areas with fractures appearing more often from exterior car objects. Head and extremities are most frequently injured. Minimal injury is found with roof crush up to 12 inches; for roof crush of 0-6 inches the percent of injuries from roof contacts is almost doubled for unrestrained occupants. Head injury severity from roof contact is not significantly related to roof crush.

by D. F. Huelke; J. C. Marsh, 4th; L. DiMento; H. W. Sherman; W. J. Ballard, Jr.
Michigan Univ., Ann Arbor
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p87-115
1973 ; 13refs
Availability: In HS-014 519

HS-014 527

A COMPARISON OF CONTACTS FOR UNRESTRAINED AND LAP BELTED OCCUPANTS IN AUTOMOBILE ACCIDENTS

The incidence and severity of contacts for lap belted and unrestrained occupants in different types of accident situations are compared. A contact is defined as a body part striking an area of the vehicle. The situations considered are defined by the clock direction of the force on the occupant, in seated location, restraint use, and whether a rollover occurred. The comparisons indicate that lap belts reduce windshield contacts when the body is thrown forward, thay they reduce certain types of side contacts for the driver when he is thrown to the side, and that they are associated with fewer front seat back injuries in rear collisions and fewer outside contacts in rollovers.

by F. Preston
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p116-29
1973 ; 4refs
Availability: In HS-014 519

HS-014 528

A COMPARISON OF INJURY SEVERITY PATTERNS FOR UNRESTRAINED, LAP BELTED, AND TORSO RESTRAINED OCCUPANTS IN AUTOMOBILE ACCIDENTS

The multidisciplinary accident investigation reports comprising a census of towaway accidents in Washtenaw County, Michigan, were statisically analyzed to observe the effects on injury associated with wearing a lap belt or torso restraint. The analysis controls on accident configurations, crash severity, seated location, and ejection.

by R. M. Shortridge
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p130-47
1973 ; 7refs
Refined version of section of, A Study of Restraint-System Use and Effectiveness, by R. Shortridge and F. Preston, June, 1973, 241p.
Availability: In HS-014 519

HS-014 529

AN OBJECTIVE METHOD OF ASSESSING LACERATION DAMAGE TO SIMULATED FACIAL TISSUES--THE TRIPLEX LACERATION INDEX

A new method for the quantitative assessment of the severity of lacerations in the two layers of chamois leather and the subcutaneous tissue simulation used in laceration investigations is described. It uses a simple mathematical formula to relate the severity of laceration to the number, length and depth of cuts in the tissue simulations. The formula gives a correlation with the existing scale used by Corning and was devised using the data on various levels of laceration obtained on an impact rig resembling the Corning Skull Impactor. The new scale provides a means of ranking severity of laceration. Called the Triplex Laceration Index, it is non-subjective and is continuous and not limited at the severe end of the scale.

by J. Pickard; P. Brereton; A. Hewson
Triplex Safety Glass Co. Ltd., Birmingham (England)
Publ: HS-014 519 Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p148-65
1973 ; 6refs
Availability: In HS-014 519

HS-014 530

INJURY MECHANISMS IN MOTORCYCLE COLLISIONS

A clinical analysis of motorcycle collisions in Southern California was performed to evaluate the patterns of injury, mechanisms of injury, and source of injury. The injuries were found to derive from three primary sources: the motorcycle, the object struck, and the surface. The different injury patterns are discussed with reference to crash dynamics, impact location on struck vehicle, and rider impact kinematics and post-collision trajectories. Certain conclusions and recommendations are drawn with respect to motorcycle modifications for injury reduction, motorcycle visibility during daylight hours, and accident causation.

by P. V. Hight; A. W. Siegel; A. M. Nahum
California Univ., San Diego. Trauma Res. Group
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p166-92
1973 ; 15refs
Sponsored by the Injury Control Prog., U. S. Public Health Service and the National Hwy. Traf. Safety Admin.
Availability: In HS-014 519

HS-014 531

SELECTED FATAL INJURY MECHANISMS AND THE RELEVANCY OF MOTOR VEHICLE AND HIGHWAY SAFETY STANDARDS

Fatal injury causation, as determined by the multidisciplinary in-situ investigation of 41 motor vehicle accident fatalities, is considered. The relevance of certain crash phase motor vehicle safety standards and highway safety program standards in these fatal accidents is discussed. Specific case histories are summarized to illustrate certain injury mechanism and the involved standards.

by N. J. Freeman; W. J. Fogarty
Miami Univ., Coral Gables, Fla. Dept. of Civil Engineering
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p193-203
1973 ; 14refs
Sponsored by the National Hwy. Traf. Safety Admin.
Availability: In HS-014 519

HS-014 532

POST CRASH CONSIDERATIONS: ESCAPE WORTHINESS AND FLAMMABILITY

The concept of escapeworthiness as related to motor vehicle safety is presented and explained. Escapeworthiness becomes a problem in the post-crash phase of an accident when passengers are entrapped and need medical attention, when the vehicle is submerged in water, and when the vehicle or surrounding environment catches fire. The methodology developed for evaluating the escapeworthiness of automobiles and buses, and for evaluating the flammability of vehicular materials, is presented. Typical data collected using the methodology is discussed. The importance of escapeworthiness to the overall area of highway safety is considered.

by J. L. Purswell; L. Hoag; R. F. Krenek
Oklahoma Univ., Norman. School of Industrial Engineering; OMEC, Inc., Norman, Okla.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p204-29
1973 ; 3refs
Availability: In HS-014 519

HS-014 533

TRAFFIC ACCIDENT RECONSTRUCTION FROM CODED INFORMATION

To test the adequacy of the variables and codes of the Southwest Research Institute data file of vehicle damage and occupant injury in 5324 accidents, an attempt was made to reconstruct a narrative description of an accident from a random sample of the coded accidents. The reconstruction was successful in demonstrating the suitability of the automated data file, but other problems were encountered and are discussed. Preliminary characteristics of the file are presented.

by G. W. Schreyer; H. D. Dixon; C. L. Braswell; J. R. Cromack
Southwest Research Inst., San Antonio, Tex. Dept. of Automotive Research
Contract DOT-HS-024-1-115
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p230-70
1973 ; 3refs
Availability: In HS-014 519

HS-014 534

THE ILLINOIS EXPERIENCE WITH REGIONALIZATION OF TRAUMA PATIENT CARE

Regionalization of trauma patient care in Illinois is evaluated. The clinical records of all accident patients entering the statewide system (13,000 in 1971-72), abstracted into a computerized information system called the Trauma Registry, are described. An indepth evaluation of these patients including multiple clinical parameters (death and morbidity) epidemiological factors (time and distance), and cost effectiveness (patient redistribution and trauma health manpower requirements) is underway and the results are presented.

by D. R. Boyd; W. A. Pizzano; R. J. Lowe
Illinois Dept. of Public Health; Cook County Hosp. Ill.; Illinois Univ. Chicago. Coll. of Medicine.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p271-8
1973 ; 11refs
Availability: In HS-014 519

HS-014 535

EMT PERFORMANCE EVALUATION: A CLINICAL TRIAL

A prospective performance evaluation of Emergency Medical Technicians (EMTs) caring for 2938 consecutive ambulance cases were carried out. Patient information data, signs and symptoms, EMT diagnosis and disposition were collected and analyzed. The EMT course time allotments were found to be roughly proportional to the incidence rates of the various diagnostic categories, with the exception of drug and alcohol abuse and psychiatric problems. EMT diagnostic accuracy varied among diagnostic groups, tending to be higher among surgical problems than medical. Consistency of treatment was lower than expected and was one area where a change in the 81-hour course emphasis would improve care delivery. The need for frequent and vigorous refresher courses is discussed along with course content. A system of objective evaluation is presented and the importance of its incorporation into an ongoing data collection and quality control system is stressed.

by W. H. Frazier; P. P. Lally; J. F. Cannon
Yale-New Haven Hosp. Conn.; New Haven Health Care, Inc., Conn.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p279-92
1973
Availability: In HS-014 519

HS-014 536

CHARACTERISTICS OF MOTOR CARRIER TRANSPORTATION OF HAZARDOUS MATERIALS

A total of 19,418 motor carriers were surveyed from 1970 through 1972 at 14 Oklahoma highway scale houses regarding commodities aboard, directions of movement, state of motor carrier registration, body styles of units, and time of day passing scale houses. Federal, state, and local hazardous materials controls were reviewed, including accident response and clean-up procedures. It was shown that 10% of all comodities are hazardous materials, with gasoline the most frequently detected representing 25% of all hazardous materials. Th shipments were found in greatest frequency on the major in terstate highways with the net movement toward metropolita areas. It was noted that no local or state controls existed fo routing, compatability of mixed cargoes, stability of cargoes or clean-up and disposal of hazardous material incidents.

by F. L. Mellish
Spokane County Health District, Wash.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p293-303
1973 ; 13refs
Availability: In HS-014 519

HS-014 537

FEDERAL SAFETY STANDARDS: THEIR OBJECTIVE AND HOW THEY AFFECT HEAVY-DUTY VEHICLES

The role of the trucking industry in accident prevention i discussed with regard to federal safety standards. Emphasis i on Federal Motor Vehicle Safety Standard 121, the brakin standard, which seeks to make trucks more compatible wit automobiles in their braking performance, stopping withou veering out of a 12-foot lane in a shorter distance. The stan dard requires about 50% of the braking to be done by fron brakes as opposed to the current 30%. Axles and springs mus be strengthened, and an anti-wheel-lock device is needed. It i suggested that a total systems approach is necessary to mee the standard; 800 brake and axle combinations must be stu died, modified, and tested to assure compatibility.

by S. J. Tompkins
Rockwell International Corp. Troy, Mich. Automotive Group
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p304-19
1973
Availability: In HS-014 519

HS-014 538

ALCOHOL AND ADULT PEDESTRIAN FATALITIES

Using data from police and coroner's records, adult pedestri ans who died in road accidents in Birmingham, England durin 1970-72 were studied. Blood alcohol levels (BALs) for the 9 pedestrians who died within 12 hours of the accident, sho that 70% had negative BALs. Of the 30% who had been drink ing, 66% had BALs in excess of 0.08% (the legal limit) an 33% over 0.15%. Accidents involving drinking pedestrians oc curred most frequently late at night and on weekends. Th presence of alcohol occurred significantly more often amon men, the 15-44 age group, single and divorced persons, an those with partly skilled or unskilled occupations. Comparis with U.S. data have suggested that although the incidence o alcohol among pedestrians in England tends to be lower th other relationships tend to be similar.

by A. B. Clayton
Birmingham Univ. (England)
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p340-50
1973 ; 14refs
Availability: In HS-014 519

HS-014 539

PHARMACOKINESIOLOGICAL STUDY OF ALCOHOLIC HANGOVER

Delayed effects of acute alcoholic intoxication were kinesiologically studied. Changes in eye-hand coordination, manipulative skills, and postural responses were objectively measured by special biomechanical apparatus and techniques. Nine healthy males were tested with various amounts of alcoholic beverages on several days in a simulated social setting. Effects of intoxication, sometimes lasting as long as 20 hours after ingestion, were found. These included decreased motor-sensory skill, prolonged reaction time and poor motor performance. Without tactile and/or visual facilitation manipulative and position skills were also impaired. There was also limitation in visual scanning and deterioration in postural control in some cases. Recognition of postintoxication hazard in industrial and traffic safety is stressed.

by C. Golk; Y.-M. Rho; I. R. Tichauer; R. C. Wolkenberg
New York Univ., N. Y.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p351-63
1973 ; 13refs
Delayed effects of acute alcoholic intoxication were kinesiologically studied. Changes
Availability: In HS-014 519

HS-014 540

MEDICAL ORIENTATION FOR DRIVER LICENSE EXAMINERS

In an effort to upgrade the screening of driver license applicants for the possible presence of medical conditions which may contribute to crash causation, the American Medical Association and American Association of Motor Vehicle Administrators started a medical orientation program for lay driver examiners. The program consists of a 2 1/2-hour videotape of lectures by five medical specialists, a slide presentation on driver limitations, and a self-testing review manual for each examiner. The program stresses the fact that examiners are not being trained as diagnosticians, but only to recognize some signs indicating the possible presence of conditions that could present a hazard to driving.

by L. N. Hames
American Medical Assoc., Chicago, Ill.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p364-70
1973 ; 10refs
Sponsored by the Automotive Safety Foundation.
Availability: In HS-014 519

HS-014 541

PROPOSAL FOR A PROTECTION CRITERION AS REGARDS ABDOMINAL INTERNAL ORGANS

Several cases of abdominal injuries caused by belt type restraint are reported in safety specialized literature. A proposal is offered for a real injury criterion to ensure internal organ protection. Such a criterion would eliminate and replace Regulation 14 design rules and compensate for a serious deficiency of current U. S. injury criteria. Risks associated with submarining are emphasized, and the need for keeping a safety belt positioned across the pelvic bones is illustrated.

by C. H. Tarriere
Renault-Peugeot Assoc., La Garenne-Colombes (France)
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p371-82
1973 ; 3refs
Availability: In HS-014 519

HS-014 542

SNOWMOBILING: CHARACTERISTICS OF OWNERS, PATTERNS OF USE, AND INJURIES

Injured and uninjured users of snowmobiles are examined along with several variables in the pre-injury, injury, and post-injury phases. Characteristics of person, machine, environment, and use that appear to contribute to the occurrance and severity of injuries are identified. Survey results are tabulated and reveal that: the annual injury rate is quite high; persons injured do not represent a random selection of users, but are high risk drivers who can be identified within the user population; the machine itself it an important contributor to the initiation of the event and the type and severity of injury; there are design problems with the machine that contribute to injury; there is potential for negative bias on the part of medical personnel treating snowmobile injuries.

by J. A. Waller; K. R. Lamborn
Vermont Univ., Burlington. Dept. of Community Medicine
Grant FD00003-SOH
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p383-407
1973 ; 15refs
Availability: In HS-014 519

HS-014 543

MOTOR CARRIER ACCIDENT EVALUATION (MEDICAL ASPECTS)

Some general activities of DOT in evaluation of medical aspects of motor carrier accidents are reviewed. Examples of truck accidents are cited to illustrate causative factors. Consideration is given to problems associated with diabetic drivers, drivers with monocular vision, and research studies of visual and auditory response, vehicular stress, and driver fatigue. The hours-of-service rules are examined along with other factors such as heat, vibration, noise, intoxication, and driver training.

by M. Ballenger
Bureau of Motor Carrier Safety, Washington, D. C.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p408-17
1973
Availability: In HS-014 519

HS-014 544

A METHOD FOR AUDITING AMBULANCE SERVICES IN A SPECIFIC AREA

The use of the computerized ambulance record for defining and auditing ambulance services to a specific region is described. Input data for the computer program were derived from information recorded on optical scanning computer forms. Output data concerned analysis of: pick-up location destination; time demand; response characteristics; quality and type of casualty care; and effect of moving ambulance bases on travel time and priority of emergencies. Data analysis precisely defined the district studied in terms of ambulance services; the response characteristics and utilization patterns; and the changes in the location of ambulances necessary for improvement of response time.

by J. R. Mackenzie; J. Harvey; R. Horton; P. Johnson; A. C. Strickler
McMaster Univ., Hamilton, Ont. (Canada); Univeristy of Western Ontario, London (Canada). Medical School; Ontario Ministry of Health, Hamilton (Canada); Henderson General Hosp., Hamilton, Ont. (Canada); Saint Joseph's Hosp., Hamilton, Ont. (Canada)
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p418-31
1973 ; 3refs
Availability: In HS-014 519

HS-014 545

RESTRAINT SYSTEM USAGE--EDUCATION ELECTRONIC INDUCEMENT SYSTEMS OR MANDATORY USAGE LEGISLATION?

Past, present, and contemplated methods of inducing belt restraint system usage are reviewed. The successes and failures of past efforts and the reasons for belt rejection by the majority of vehicle occupants is examined. An approach for increasing usage of present restraint systems is suggested: the use of a legal device, that of finding a plaintiff guilty of contributory negligence because of belt restraint system non-use in a civil action resulting from injuries caused by an automobile accident.

by J. D. States
Rochester Univ., N. Y. School of Medicine
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p432-42
1973 ; 34refs
Availability: In HS-014 519

HS-014 546

FIELD TESTING 1000 AIR CUSHION EQUIPPED AUTOMOBILES

As a step toward eventual quantity production of cars equipped with passive restraint systems, General Motors built 1000 cars equipped with air cushion restraint systems. They were placed in high mileage fleets where they would be exposed to a variety of operating conditions. After about one year and 19 million miles, the air cushion had operated as it was intended in nine impacts of the type and severity to cause cushion deployment and in over 230 non-deployment accidents. One inadvertent actuation occurred. This sample of real-life operation suggests that it is feasible to present limited offering of the system as an option to the general public.

by G. R. Smith
General Motors Corp., Warren Mich.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p443-64
1973
Availability: In HS-014 519

HS-014 547

CURRENT SIGNIFICANCE OF VISUAL PROBLEMS IN PENNSYLVANIA DRIVERS

Crash analysis by the Pennsylvania Department of Transportation for the calendar year 1971, indicates 81,696 crashes causing 667 death, 1,604 bodily injuries, and 59,984 cases of property damage in this state. Alcohol was the largest identifiable causative factor among the fatalities and related to 5,91 crashes which caused bodily injury or property damage. Visual factors had prime causative identification in 72 deaths, 1,60 bodily injuries, and 3,639 cases of property damage. Such efforts to identify causative data underline revised visibility and illuminating standards which the National Traffic Safety Administration is seeking to put into effect.

by A. H. Keeney
Wills Eye Hosp. and Res. Inst., Philadelphia, PA.
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p465-9
1973 ; 21refs
Availability: In HS-014 519

HS-014 549

BELT OCCUPANT RESTRAINT EFFECTIVENESS

Data from a previous paper on seat belt occupant restraint effectiveness are briefly reviewed. Reports of the effectiveness of seat belt usage legislation in Australia are examined with regard to ejection prevention, injury prevention in side impacts frontal crash modes and distribution of impact forces, and severe human trauma. Shoulder belt slack to prevent submarining is questioned, along with the effects of the trend toward smaller cars, and animal and volunteer tests with air cushion systems.

by C. Y. Warner
Brigham Young Univ., Provo, Utah
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p491-501
1973 ; 8refs
Availability: In HS-014 519

HS-014 550

THE EFFECT OF REHABILITATION ON THE DRIVING BEHAVIOR OF PROBLEM DRINKERS

Whether persons with alcoholism incur more driving infractions than non-alcoholic drivers is examined along with the in

their infractions. A total of 391 rehabilitated alcoholic and 391 non-alcoholic drivers were studied by examination of their driving records. It was found that: before treatment, experimentals had significantly more convictions than controls for DUIL, reckless driving, other moving violations, total collisions, collisions involving property damage, and driving without a valid license (no significant differences after treatment): offenses increased yearly before treatment and decreased yearly after; raw speeding data without miles-per-hour over the speed limit predicts neither crashes nor alcoholism.

by F. A. Seixas
National Council on Alcoholism, New York
Publ: HS-014 519, Proceedings of 17th Conference of the American Association for Automotive Medicine, Oklahoma City, 1973 p502-20
1973 ; 12refs
Availability: In HS-014 519

HS-014 551

COLLECTION AND ANALYSIS OF COLLISION DATA FOR DETERMINING THE EFFECTIVENESS OF SOME VEHICLE SYSTEMS

Selected vehicle safety systems were evaluated on the basis of routinely reported accident records together with specially collected additional data. Conclusions relating to the effectiveness of each system are summarized: Energy-absorbing steering assemblies with Saginaw ball-and-tube and Ford slotted columns appear to provide substantial protection in frontal impacts. The fixed or high seat back type of head restraint seems to be more effective than the adjustable restraint. A side door reinforcement beam significantly reduces the risk of a driver being injured when his car is struck by another car on the passenger side. Lap belts provide substantial protection in frontal impacts between two cars and as much protection to the driver as side-door reinforcement (substantial) in passenger-side impacts. Subcompact automobile injury risk for belted driver equals that of unbelted drivers in full-size cars. Data on vehicles other than automobiles are also collected.

by A. J. McLean
Motor Vehicle Manufacturers Assoc. of the United States Inc., Detroit Mich.
Contract UNC-7301-C19
1974 ; 116p 4refs
Availability: Corporate author

HS-014 552

EFFECTS OF PRACTICE AND ALCOHOL ON TWO PSYCHOMOTOR TASKS: IMPLICATIONS FOR AN AUTOMOBILE ALCOHOL IGNITION INTERLOCK

The effects of alcohol on performance of two psychomotor tasks are examined. Task 1 requires the subject to memorize a five-digit number, retain it for a short interval, and respond by pressing number pushbuttons in the appropriate order. Dependent variables are speed and number of errors in response. Task 2 requires self-paced stylus tracking of a curving slot in a metal plate. Dependent variables are tracking error time and total tracking time. Some 16 subjects were tested after five practice sessions, after alcohol consumption, during the absorption, peak, and elimination stages of the blood alcohol cycle at BACs of 0.05%, .10%, and 0.05%. It is concluded that alcohol ignition interlock systems need to be designed, incorporating the tasks examined to each individual driver's performance to detect impairments such as those produced at BACs of 0.10%.

by S. P. Sturgis, 3rd.
Eastern Michigan Univ., Ypsilanti
1972 ; 94p 33refs
Supported by the Automobile Mfr.'s Assoc., Inc. Master's thesis.
Availability: Reference copy only

HS-014 553

A STUDY OF RESTRAINT SYSTEM USE AND EFFECTIVENESS. SPECIAL REPORT

Restraint use and effectiveness are examined in terms of determining the demography of use, comparing the incidence and severity of injuries for users and non-users, and comparing the incidence and severity of injury from those various areas in the vehicle that were contacted by the occupants. It was found that 16-22-year-old drivers, drivers not using limited-access roads, and drivers who had been drinking are the least likely users of seat belts. A survey shows that the most prevalent method of circumventing the seat-belt buzzer system is to keep the belt permanently buckled.

by F. L. Preston; R. M. Shortridge
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Rept. No. UM-HSRI-SA-73-10 ; 1973 ; 221p 18refs
Sponsored by the Motor Vehicle Mfrs. Assoc., Inc., Detroit.
Availability: Corporate author

HS-014 554

A COMPARATIVE EVALUATION OF FIVE TIRE TRACTION MODELS. INTERIUM DOCUMENT NO. 6. TIRE TRACTION CHARACTERISTICS AFFECTING VEHICLE PERFORMANCE

Tire traction models are examined in order to develop a mathematical model capable of predicting the significant mechanical performance characteristics of the pneumatic tire from basic design and operating variables. A systematic set of definitions for the operating variables describing tire orientation, motion, and shear force generation was developed in the framework of a system of tire and contact region coordinated defined to facilitate tire model study. Four published tire models are recast in this new coordinate system and rederived with the common set of operating variable definitions. A fifth tire model is derived by a change of pressure distribution. Tire model responses to a common set of tire characterizing data and operating variable ranges are compared and the effects of various assumptions made during model derivation are identified.

by J. T. Tielking; N. K. Mital
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
1974 ; 166p 10 refs
Sponsored by the Motor Vehicle Mfrs. Assoc., Inc., Detroit.
Availability: Corporate author

HS-014 555

EFFECTS OF PRACTICE AND ALCOHOL ON SELECTED SKILLS: IMPLICATIONS FOR AN AUTOMOBILE ALCOHOL IGNITION INTERLOCK

Drivers practiced two psychomotor tasks before being tested during absorption, peak, and elimination phases of the blood alcohol cycle at BAC's of 0.05%, 0.10% and 0.05%. A significant performance decrement was found at the 0.10% level compared to the performance at 0% BAC, after improvements due to practice had ceased on both tasks used. The task involving stylus tracking showed reasonable test discrimination between subjects when sober and after drinking.

by S. P. Sturgis; R. G. Mortimer
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Publ: 1972
Rept. No. HUF-TM-2 ; 28p 32 refs
Based on Master's thesis by S. P. Sturgis, Eastern Mich. Univ. (See HS-014 552). Presented at the 44th Annual Meeting of the Midwestern Psychological Assoc., May 1972.
Availability: Corporate author

HS-014 556

EFFECTS OF PRACTICE AND ALCOHOL ON SELECTED SKILLS: IMPLICATIONS FOR AN AUTOMOBILE ALCOHOL IGNITION INTERLOCK

A stylus-tracking task and a task devised by General Motors were examined for their prospective value in alcohol ignition interlock systems. Some 16 subjects were extensively practiced on the two tasks before being tested during the absorption, peak, and elimination phases of the blood alcohol cycle at BAC's of 0.05%, 0.10%, and 0.05%. While significant decrements in performance were found in both tasks at 0.10% BAC, only the stylus-tracking task showed useful test discrimination between subjects at BAC's of 0% and 0.10%.

by S. P. Sturgis; R. G. Mortimer
Publ: Perceptual and Motor Skills v37 p267-74 (1973)
1973 ; 10refs
Based on Master's thesis by S. P. Sturgis, Eastern Mich. Univ. (See HS-014 552). Presented at the 44th Anual Meeting of the Midwestern Psychological Assoc., Cleveland, May 1972.
Supported by the Motor Vehicle Mfrs. Assoc., Inc.
Availability: See publication

HS-014 557

AN EVALUATION OF SEVERAL COMMERCIALLY AVAILABLE AUTOMOTIVE HAND CONTROLS

Some of the currently available automotive hand controls for throttle and brake are reviewed. The operational design, mechanical integrity, and strenght necessary for optimal use are discussed. Shortcomings of some of the equipment are noted as well as both specific and general recommendations for improvement.

by W. A. Hyman; P. H. Newell, Jr.
Texas A and M Univ., College Station. Dept. of Industrial Engineering
Contract VA-V-101(134)
1973 ; 99p 17refs
Availability: Corporate author

HS-014 558

OPERATOR SEAT DESIGN PROBLEMS IN REFERENCE TO THEORETICAL VIBRATION ISOLATION AND PRACTICAL EUROPEAN RECOMMENDATIONS

A survey of the literature on human tolerance to vibration and on seat transmissibility is presented. A summary of European regulations on seat characteristics includes not only vibration absorption requirements but also recommended dimensions and necessary adjustments. Safety rules as issued in some countries, especially for tractor seats, are also discussed. The practical problem of making a seat in accordance with all these factors at a reasonable cost with durability and easy adaptation to the unskilled user is described. Conventional systems and new trends are briefly indicated.

by J. H. de Longchamp
Sable Freres International (France)
Rept. No. SAE-730824 ; 1973 ; 11p 7refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 559

A LITERATURE SURVEY ON SOME HEALTH ASPECTS OF LEAD EMISSIONS FROM GASOLINE ENGINES. REVIEW PAPER

Several health aspects related to lead emissions are reviewed. Topics include: the amount and concentrations of lead in the atmosphere; the influence of atmospheric lead on the lead content of food and drinking water; the influence of lead alkyls or the hydrocarbon, carbon monoxide, and oxides of nitrogen emissions from gasoline engines; lead burdens in humans, including absorption and excretion (lead in blood and urine); lead burdens in selected population groups; animal studies; assessment of health hazards from atmospheric lead; and current research.

by P. C. Blokker
Publ: Atmospheric Environment v6 p1-18 (1972)
1972 ; 63refs
Availability: See publication

HS-014 560

PRIMARY COMPONENTS OF SIMULATED AIR BAG NOISE AND THEIR RELATIVE EFFECTS ON HUMAN HEARING. FINAL REPORT

The relative contributions to auditory temporary threshold shift (TTS) of the air bag vehicle volume displacement and of the high frequency noise burst associated with activation, and turbulence, unfolding, etc., of the system were investigated. Ten subjects were tested with TTS measured for 12 discrete frequencies ranging from 125 Hz to 12 kHz for each exposure condition. The high frequency noise burst produced the greatest amount of TTS. The positive pressure pulse produced no measurable changes in hearing levels. The two components occurring simultaneously resulted in less TTS than that produced by the noise burst alone. The results suggest that TTS associated with air bag inflation noise is primarily the

pulse component appears to reduce the effectiveness of the high frequency noise burst in producing YYS. Implications relative to the use of air bag restraint systems are discussed.

by H. C. Sommer; C. W. Nixon
Aerospace Medical Res. Lab. (6570th) Wright-Patterson AFB, Ohio
Contract DOT-IA-0-1-2160
Rept. No. AMRL-TR-73-52 ; 1973 ; 23p 8refs
Rept. for Oct 1972 - Mar 1973.
Availability: NTIS

HS-014 561

VEHICLE AND OCCUPANT FACTORS THAT DETERMINE OCCUPANT INJURY

The relationships among the vehicle-related factors (velocities, masses, crush and rebound characteristics) which determine injury potential are analyzed. It is shown that the injury potential can be estimated for actual crashes from some of the better defined vehicle-related factors. Computer-simulation results for injury-related criteria as a function of occupant-related factors over the range of injury potential of interest are given. The analysis results in conclusions applicable to many areas of automotive safety.

by J. F. Marquardt
General Motors Corp., Warren, Mich. Environmental Activities Staff
Rept. No. SAE-740303; GMC-EAS-5576 ; 1974 ; 17p 10refs
Presented at the Automotive Engineering Congress, Detroit, 25 Feb - 1 Mar 1974.
Availability: SAE

HS-014 562

THE DYNAMIC ROLE OF EYE-HEAD ANGULAR DISPLACEMENTS IN HUMAN VEHICULAR GUIDANCE

Three experiments on the effects of angular displacements of a driver's vision, head, and combined eye-head separation on steering produced through closed-circuit television systems are reported. Steering errors increased with increasing magnitudes of such displacements in actual driving. Results are discussed with respect to driver-vehicle visual requirements, visual-motor coordination in steering, and design of driver training devices.

by H. S. R. Kao
Publ: Journal of Applied Psychology v57 n3 p320-7 1973 ; 16refs
Presented at the ERS-IEEE International Symposium on Man-Machine Systems, Cambridge, England, 8-12 Sep 1969.
Supported by Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Availability: See publication

HS-800 873

BASIC RESEARCH IN CRASHWORTHINESS 2-- COMPARISON OF TELEDYNE-GEOTECH CRASH RECORDER DATA AND ACCELEROMETER DATA. INTERIUM REPORT

A limited comparison of accelerations measured using conventional strain gauge accelerometers and a newly developed self-contained crash recorder designed to record accelerations is presented. The test data were obtained on vehicle-to-pole and vehicle-to-vehicle impacts. An NHTSA addendum is included which eliminates significant data reduction errors of disc crash recorder data by using new encoding equipment. Data reduced with this new equipment are compared with Calspan accelerometer data.

by A. R. Trenka
Calspan Corp., Buffalo, N. Y.
Contract FH-11-7622
Rept. No. YB-2987-V-15 ; 1974 ; 111p
Includes addendum prepared by NHTSA.
Availability: NTIS

HS-800 979

SURVEY OF SUSPENSION SYSTEMS ON TRAVEL TRAILERS. VOL. 9. FINAL REPORT

Travel trailer suspension system data as surveyed at six different field locations are summarized. Loading patterns, load capacities, and consumer knowledge of trailer suspension systems are examined, with emphasis on tires, wheels, springs, and axles. Data sources for the study were weight and tire inflation measurements, suspension system capacity ratings, and safety guidelines furnished to owners, It is concluded from the study of 2690 trailers surveyed that trailer owners do not have available to them information on the importance of keeping the weight within the suspension system capacities or instructions on how to do this.

by N. Ludtke
Pioneer Engineering and Mfg. Co., Inc., Warren, Mich.
Contract DOT-HS-098-1-136
1973 ; 585p
Report for May 1971 - Mar 1972.
Availability: NTIS

HS-801 025

TRI-LEVEL ACCIDENT STUDY. FINAL REPORT

The Tri-Level Accident Study for 1972, conducted in eight western New York state counties, is presented. Details of data collection, accident case presentation to the program sponsors, and three data analysis subjects are given. These include: performance evaluation of automobile head restraints; the effects of data type and reporting method on Vehicle Deformation Index generation; and school bus accidents in Western New York.

by J. W. Garrett; D. F. Morris; R. C. Braisted; D. L. Hendricks; S. W; Chesley
Calspan Corp., Buffalo, N. Y.
Contract DOT-HS-053-2-277; MVMA-CAL-7207-C-129
Rept. No. ZM-5086-V-2 ; 1974 ; 117p 5refs
Report for 1 Jan 1972 - 31 Dec 1972.
Availability: NTIS

HS-801 099

DETECTING THE HIGH RISK DRIVER: THE DEVELOPMENT OF A RISK QUESTIONNAIRE. FINAL REPORT

The development of a driver risk questionnaire to be used for the identification of accident-prone drivers from problem

drinking was used in two phases of investigation; 532 drivers and 1059 drivers respectively participated in the two phases. The results based on analysis of the retrospective data of the accidents which were reported by the drivers, showed promising moderate correlations between these accidents and the constructed risk score. The most important validating correlation appearing on driving records was low and statistically not significant. Since it was shown that recorded accidents are less than those reported by the drivers, other validating criteria should be used in future research.

by M. L. Selzer; A. Vinokur
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract DOT-HS-031-1-187
1974 ; 50p 23refs
Availability: NTIS

HS-801 102

VEHICLE DISABLEMENT STUDY. TECHNICAL REPORT. FINAL REPORT

A total of 7000 vehicles that had experienced on-road failure were studied in the San Francisco Bay Area. Questionnaires returned by motorists were coded and keypunched for an automated data file. Computer output was generated in the form of cross-tabulation of component faults by year, make, and model of vehicle. Vehicle make and model year for sample vehicles were correlated with comparable data at the county, state, and national levels. Values ranged from 0.98 for county and sample to 0.88 for national and sample comparisons. The high correlation indicated that the sample was representative of the vehicle population and validated the identification of critical component systems for disablements.

by D. N. Schmidt; W. L. Raley; W. R. Long; L. C. Holter
Traffic Safety Res. Corp., Palo Alto, Calif.
DOT-HS-261-3-771
Rept. No. TSR2102 ; 1974 ; 139p
Report for Jul 1973 - Jan 1974.
Availability: NTIS

HS-801 105

EVALUATION PLAN FOR ORBIS. INTERIM REPORT

The evaluation plan and experiemntal design for determining the effectiveness and usability of ORBIS, a proprietary device for automatically detecting and recording speeding motorists, is presented. The experimental evaluation is conducted in two phases, in cooperation with several local jurisdictions who will install, operate, and maintain the ORBIS system. The first phase examines changes in speed behavior due to ORBIS; the second tests for changes in accident rate and severity.

by P. W. Davis
Department of Transp., Cambridge, Mass. Transp. Systems Center
Rept. No. DOT-TSC-NHTSA-73-11 ; 1974 ; 62p 8refs
Report for Oct 1972-Jun 1973.
Availability: NTIS

HIGHWAY TRAFFIC SAFETY ADMINISTRATION BY DOMESTIC AND FOREIGN VEHICLE MANUFACTURERS, JANUARY 1, 1973 TO DECEMBER 31, 1973

Specific recall campaigns by various domestic and foreign automobile and parts manufacturers are summarized. Summary tabulations of safety defect recall campaigns are given first for the number of campaigns and number of vehicles involved. More detailed data are presented giving date of company notification, vehicle make and model, model year, brief description of defect and manufacturer's corrective action, number of pages on file, and number of vehicles recalled.

National Hwy. Traf. Safety Administration, Washington, D. C.
1973 ; 85p
Availability: GPO

HS-801 110

THE EFFECT OF REHABILITATION ON THE DRIVING BEHAVIOR OF PROBLEM DRINKERS. FINAL REPORT

Driving infractions incurred by alcoholic drivers are compared with those of non-alcoholic drivers, and the effect of successful treatment on the alcoholics on decreasing the number of infractions is examined. Some 391 experimental subjects employed in large industries and identified as alcoholics were treated and returned to satisfactory job performance. An equal number of controls was randomly selected from the same companies and compared. Motor vehicle department records for each were studied for a three-year period before the alcoholic's entry into a treatment program, and for the three years following his return to satisfactory job performance. Driving records of controls were studied for the same dates as the experimentals to which they were matched. Statistically significant results were obtained and reported.

by F. A. Seixas; A. L. Hopson
National Council on Alcoholism, New York
Contract DOT-HS-264-2-479
1974 ; 111p refs
Report for Jul 1972 - Jul 1973.
Availability: NTIS

HS-801 121

IMPACT TEST OF A NEAR-PRODUCTION AIR CUSHION RESTRAINT. FINAL REPORT (SYNOPSIS)

The impact protection efficacy of a production automobile air cushion restraint was tested under experimental conditions simulating an automotive barrier crash. The restraint was designed and fabricated by General Motors to provide passive restraint for the center and right front seat passengers during frontal impact. The impact tests were conducted on the Daisy Decelerator at Holloman Air Force Base, New Mexico. Composite acceleration profiles measured during automobile barrier crashes were used to design the deceleration patterns. The nominal peak accelerations varied from 10 to 22 g at velocities ranging from 16.1 to 31.1 mph. Results show that observed

trauma on test volunteers was generally milder than in previous tests. The average Head Severity Index was 258.

by J. Brinkley; G. Mohr; H. Russell; S. Cooper; J. Shaffer
Aerospace Medical Res. Lab. (6570th)
DOT-HS-017-1-017-IA
1974 ; 17p
Availability: NTIS

HS-801 131

THE DEVELOPMENT OF GUIDES FOR TEACHER PREPARATION IN DRIVER EDUCATION. FINAL REPORT

The development of guides for teacher preparation in driver education is described. Two guides were prepared, one for the preparation of secondary school driver education teachers, and the other for professional driving school instructors; Four steps are involved for each: analysis of instructional requirements, establishment of instructional objectives, preparation of guides, and evaluation.

by A. J. McKnight; A. G. Hundt; J. R. Cunningham
Human Resources Research Organization, Alexandria, Va.
Contract FH-11-7602
Rept. No. HumRRO-FR-D1-73-1 ; 1974 ; 29p 7 refs
Report for Jun 1970 - Jan 1973.
Availability: NTIS

HS-801 137

A MOTORCYCLE SAFETY HELMET STUDY. NHTSA STAFF REPORT

This study compares head injury for motorcycle riders who were involved in traffic accidents in the States of Michigan or Illinois. Since most of the Michigan riders wore helmets because they were required to do so by law but most of the Illinois riders did not because helmet usage is not mandatory in Illinois, this comparison is made to estimate the differences in head injury resulting from compliance with the Michigan safety helmet law. Secondly, this study provides estimates of the actual effectiveness of safety helmets in reducing head injury in the more severe, higher speed accidents which occurred on Interstate highways and freeways in rural areas of Illinois. Finally, a comparison is made of the extent of helmet usage in a helmet-law State (Michigan) to that in a non-helmet-law State (Illinois).

by H. A. Richardson
National Hwy. Traf. Safety Administration, Washington, D. C.
1974 ; 42p 9 refs
Availability: NHTSA

HS-801 140

WASHTENAW COUNTY ALCOHOL SAFETY ACTION PROGRAM EVALUATION SUMMARY; FINAL REPORT

The Washtenaw County, Michigan, Alcohol Safety Action Project (ASAP), operative for 2 1/2 years and designed to reduce alcohol-related (AR) crashes, was evaluated at three levels. Crash criterion measures showed that the stated goals were not realized. Progress was evidenced by reductions in the proportions of night-time drivers with positive blood alcohol concentrations. Countermeasure results showed that drunk driving law enforcement was effective in identifying problem drinking drivers for subsequent court processing but not a stand-alone countermeasure. Presentence investigation and court-supervised referral were effective. Remedial activities and results were uneven, and long-term rehabilitation for identified probelm drinkers was deficient. Subsequent AR driving events were affected. Information components were marginally effective in informing public and not successful in altering attitudes or behavior.

by L. D. Filkins
Michigan Univ., Ann Arbor. Hwy. Safety Res. Inst.
Contract FH-11-7535
Rept. No. UM-HSRI-AL-73-17 ; 1974 ; 50p 12 refs
Prepared for the Washtenaw County Alcohol Safety Action Prog. Washtenaw County Health Dept., Ann Arbor, Mich.
Availability: Corporate author

HS-014 563

LESS EMISSIONS: STRATIFIED CHARGE ENGINE (CVCC) DIESEL ENGINE

Problems related to engine exhaust emissions are discussed with emphasis on the development of Honda's Compound Vortex Controlled Combustion (CVCC) engine and the diesel engine. The design and benefits of each are described. It is suggested that increased interest in the stratified charge engine will lead to further studies and its introduction to the American car market. It is noted that the diesel engine generates much less objectionable smog components in its exhaust and is free of all the exhaust emission control devices found on late model gasoline cars, but that it may not be able to meet the more stringent 1976 oxides of nitrogen regulations.

by G. F. Wesley
Publ: The Battery Man p5,9,19-20 (Apr 1974)
1974
Availability: See publication

HS-014 564

FATAL ACCIDENTS DURING A TWELVE-MONTH PERIOD (1972), INVOLVING VOLVO MODELS 140 AND 164 VEHICLES

Fatal accidents involving Volvo models 140 and 164 vehicles in Sweden in 1972 are analyzed to indicate the situations and the ways occupants are fatally injured, and to what degree safety-improvement items could have led to a reduction in the number of fatalities. The items evaluated include: improved interior with energy-absorbing units; safety belts and the VESC-body, with regard to impact/energy absorption in frontal, lateral, rear and roof deformation; and anti-skid brakes. Appraisal was primarily based on degree of vehicle deformation and the reduction in size of the passenger compartment. On the basis of the Volvo 140-series cars, it would have been possible to achieve a fatal injury reduction of 40-55% through interior improvements alone, or, optionally, through 100% use of safety belts.

by L. Samuelsson
Publ: Report on the Fourth International Technical Conference on Experimental Safety Vehicles, Kyoto, Japan, March 13-16, 1973 p371-91
1973
Appendix 3. See HS-013 939.
Availability: In HS-013 939

HS-014 565

THE CLEAN AIR ACT: ANALYZING THE AUTOMOBILE INSPECTION, WARRANTY, AND RECALL PROVISIONS

The difficulties of using the regulatory powers delegated by the Clean Air Act of 1970 for reducing motor vehicle emissions are analyzed. Questions are raised regarding statutory provisions for state vehicle inspection, recall initiated by the Environmental Protection Agency, and manufacturer warranty of emission levels. Legislative provisions of the act are reviewed, along with their adoption by the states, cost factors, program confidence and public acceptability, organizational structure and incentives of manufacturers, and the likilihood of recall. Policy alternatives are outlined, and it is concluded that viable state emission inspection systems coupled to warranty and recall are unlikely to be implemented.

by J. M Appleman
Publ: Harvard Journal on Legislation v10 n4 p537-64 (Jun 1973)
1973 ; 28p refs
Availability: See publication

HS-014 566

PHYSICAL CONDITION REPORT OF COMMERCIAL DRIVERS INVOLVED IN ACCIDENTS FOR YEAR 1971

Data related to 351 accidents in which the driver's condition may have been a causative factor at the time of the accident are presented. Data was drawn from motor carrier questionnaires and from accident reports originally submitted by the carriers. Information is given on driver heart attacks, blackouts, drinking, sleep, and drug usage. The statistics presented apply only to casualties to carriers' drivers and the resultant property damages to carriers' vehicles.

Bureau of Motor Carrier Safety, Washington, D. C.
1973 ; 17p
Availability: Corporate author

HS-014 567

DEMAND FOR ENERGY BY THE TRANSPORTATION SECTOR AND OPPORTUNITIES FOR ENERGY CONSERVATION

The structure of demand for transportation services and energy is discussed both historically and as projected to the year 2020. In the near-term, improvements and modifications to existing automobile and truck types offer an opportunity to reduce relative energy consumption. For the long-term, novel fuels and electric energy may provide a way to reduce the dependence of surface transportation upon petroleum. Some non-technological actions are also discussed which offer potential energy savings within the transportation sector. Estimates of energy savings are provided, and several factors are illustrated by examples.

by A. C. Malliaris; R. L. Strombotne
Department of Transp., Cambridge, Mass. Transp. Systems Center; Department of Transportation, Washington, D. C.
Rept. No. ASME-73-ICT-87 ; 1973 ; 12p 15refs

HS-014 568

VEHICLE OCCUPANT RESTRAINTS. A REVIEW OF LEGISLATION, PUBLIC ATTITUDES, USE REQUIREMENTS AND THE COST-EFFECTIVENESS OF MOTOR VEHICLE OCCUPANT RESTRAINT SYSTEMS.

Problems related to occupant restraint system usage ar described. Legislation, public attitudes, use requirements, an the cost effectiveness of the systems are reviewed. Enginee ing and educational approaches are included, along wit known and potential payoffs, in preventing injury. It is cor cluded that mandatory laws are necessary, although the dif ficulties of enforcement are cited.

by V. J. Perini
Highway Users Federation for Safety and Mobility, Washington, D.C.
1973 ; 15p 1ref
Availability: Corporate author $0.50

HS-014 569

BUTADIENE-STYRENE COPOLYMERS FOR USE IN TIRES

The use of butadiene-styrene copolymers in tires is discussed The materials have been developed by modifying the micros tructure and molecular configuration by the techniques o solution polymerization and by using discriminatory control o polymerization conditions. Inherent characteristics, processin behavior, suggested cure systems, vulcanizate properties, an performance data are presented to typify two of the polymers a 77/23 and an 85/15 butadiene-styrene copolymer. Considera tion is given to styrene level, nuclear magnetic resonanc blockiness, processing, mill banding, vulcanization, Moone scorch and rheometer cure rate, the effects of sulfur level o tread wear, the effect of severity and seasons, tire construc tion, skid and traction, and factory tire tests.

by H. E. Railsback; W. S. Howard; N. A. Stumpe, Jr.
Publ: Rubber Age v106 n4 p46-55 (Apr 1974)
1974 ; 5refs
Availability: See publication

HS-014 570

DRIVER LICENSE ADMINISTRATION REQUIREMENTS AND FEES 1974

Tabular information is presented, provided by state drive licensing authorities, which shows the administrative require ments and qualifications needed to obtain driver licenses in 5 states and the District of Columbia, together with the drive license content and driver improvement provisions.

by A. Mundy
Federal Hwy. Administration, Washington, D. C.
1974 ; 20p
Prepared in cooperation with the American Assoc. of Motor Vehicle Admin. and the National Hwy. Traf. Safety Admin.
Availability: Corporate author

HS-014 571

HOW TOUGH IS THE ENVIRONMENT FOR AUTO ELECTRONICS?

Aspects of vehicle electronics systems and the related actuating devices are examined in relation to the variety of temperature and humidity conditions in which they must operate. The classification of actuators is discussed, and a designer's checklist for their selection is presented. The importance of modulation in actuator choice is stressed. Further consideration is given to wide environmental extremes, environmental simulations, extreme underhood temperatures, gravel bombardment, test profile development, kinds of automotive shock (shipping, handling, and installation; operational; crash), harsh voltage anomalies, noise and radiation.

Publ: Automotive Engineering v82 n1 p19-25, 61 (Jan 1974)
1974
Based on two papers, "Actuating Devices for Electronically Controlled Systems," by F. Berger, Essex International, Inc., and "Environmental Guidelines for the Designer of Automotive Electronic Components," by O. T. McCarter, General Motors' Advance Product Engineering Labs.
Availability: See publication

HS-014 572

ENGINEER'S GUIDE TO THERMOPLASTIC ELASTOMERS

The use of thermoplastic polymers for automotive applications, their availability, and their engineering properties are discussed. Various types are described, including olefinics, saturated styrene block copolymers, polyethylene grafts, copolyesters, and thermoplastic urethane. Five approaches to sight shield selection are outlined. Applications are divided into three general areas (interior uses, underhood uses, and exterior uses), all of which make specific demands on the material. They must meet automotive requirements in terms of rigidity, stiffness, distortion and droop resistance, paintability, acceleration and exposure, and impact testing.

Publ: Automotive Engineering v82 n1 p26-9 (Jan 1974)
1974
Based on "Materials Development," by J. M Bowman, E. I. DuPont De Nemours and Co. Presented at the 1973 SPI National Plastics Exposition Conference, Chicago.
Availability: See publication

HS-014 573

A STUDY OF VIBRATION-RESISTANT FASTENERS

A preview is offered of locking fastener identification, benefits, and problems. Fastener performance employing the latest transverse shock and vibration equipment is also discussed, showing that lock washers do not really lock. It is concluded that chemical-locking fasteners possess the best features of both free-spinning and friction-locking fasteners. Chemical-locking fasteners have low on-going torque, high breakloose, and moderate prevailing torque, and also offer ideal torque tension relationships and sealing. Transverse shock and vibration testing are described.

by M. B. Pearce, Jr.
Loctite Corp., Newington, Conn.
Rept. No. SAE-730825 ; 1973 ; 6p 6refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 574

HOW FIAT DESIGNED THREE LIGHTWEIGHT ESV'S

Approaches taken by Fiat for lightweight experimental safety vehicles in the 1500, 2000, and 2500-lb weight classes are described. The vehicles follow the theory of form following function (safety function) in vehicle design. Photographs and diagrams are presented to show three designs conceived as a direct derivation from a car model in current volume production. Only the general layout of mechanical units, interior size, wheelbase, and performance characteristics of the original model are retained. It is concluded that the severity of ESV crashworthiness requirements involves a technical and cost burden unjustifiable when measured against potential benefits; the criteria and limits of the ESV survival space requirements are virtually ineffective; mechanical layouts are substantially equivalent.

Publ: Automotive Engineering v82 n2 p46-9 (Feb 1974)
1974
From SAE Paper No. 740207, "Experimental Safety Vehicles in the 1500 lb., 2000 lb. and 2500 lb. Weight Classes," by G. Puleo, Fiat S.p.A. To be presented at the 1974 Automotive Engineering Congress & Exposition, Detroit, 25 Feb - 1 Mar.
Availability: See publication

HS-014 575

THE EFFECT OF UNLEADED FUEL COMPOSITION ON POLYNUCLEAR AROMATIC HYDROCARBON EMISSIONS

Three cars operated for about 8000 miles on each of four unleaded gasolines, and exhaust polynuclear aromatic (PNA) and lube oil PNA content were measured periodically. Results of the study show that increases in both light C6-C8 fuel aromatics and fuel-contained PNAs can results in significantly increased exhaust PNAs. Vehicles meeting increasingly strigent hydrocarbon and carbon monoxide emissions standards emit greatly reduced quantities of exhaust PNAs, though the rate of lube oil PNA accumulation appears to be unaffected by emissions control systems. Accumulated lubricating oil mileage was found to correlate with increased PNA emissions with a high level of statistical significance, possible due to an increase in lube oil PNA content with mileage accumulation. Oil change was found to result in an immediate reduction in PNA emissions.

by H. K. Newhall; R. E. Jentoft; P. R. Ballinger
Chevron Res. Co., Richmond, Calif.
Rept. No. SAE-730834 ; 1973 ; 11p 8refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricatns Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 576

SILICONE BRAKE FLUIDS: FRIEND OR FOE?

Performance information on silicon brake fluids is presented from leading silicone producers. Benefits of silicone-based fluids are outlined, and data are given on water absorption, boiling point, low temperature properties, corrosion resistance, vapor pressure, compatibility, and cost. It is noted that toxicity is not a problem with silicones. The materials are not biodegradable but acceptable disposal techniques are known. Silicone brake fluids also have no effect on car finishes.

Publ: Automotive Engineering v82 n2 p58-60 (Feb 1974) 1974
Based on SAE papers: 740128, "Performance Characteristics of Silicone Brake Fluids," by G. R. Browning, General Electric Co.; 740130, "Silicone Brake Fluids: Friend or Foe," by G. W. Holbrook et al, Dow Corning Corp.; 740126, "Brake Fluid Temperatures Obtained in Alpine Vehicle Trials," by I. Burgess, Castrol Res. Lubricants and 740129, "Engineering Design Benefits of Silicon Brake Fluids," by D. R. Chapman, Stauffer Chemical Co. To be presented at the 1974 Automotive Engineering Congress & Exposition, Detroit, 25 Feb - 1 Mar.
Availability: See publication

HS-014 577

MECHANISMS OF POLYNUCLEAR AROMATIC HYDROCARBON EMISSIONS FROM AUTOMOTIVE ENGINES

Mechanisms that influence emissions of polynuclear aromatic hydrocarbons were investigated with an on-line fluorescence PNA detector. PNA can accumulate at the surfaces and within deposits of a combustion chamber, and some of these PNA are vaporized during engine operation. Increased heat output to establish combustion chamber deposits (for example, from increased spark advance, knock, or high-speed operation) enhances PNA emissions, at least temporaily. At several steady speeds, PNA emissions were compared, using a rotary engine vehicle and a similar car with a reciprocating spark ignition engine. With the emissions control system disabled, the rotary engine automobile exhibits very high PNA emissions relative to the piston engine. However, exhaust emission control devices, such as the thermal reactor on the rotary engine car, can be highly effective in destroying PNA.

by J. L. Laity; M. D. Malbin; W. W. Haskell; W. I. Doty
Shell Devel. Co., Torrance, Calif. MTM Product Res. and Devel. Lab.
Rept. No. SAE-730835 ; 1973 ; 12p 39refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 578

DESIGNING THE PLASTICS XP-898

The XP-898 prototype passenger vehicle which utilizes a sandwich construction of fiberglass-reinforced plastic skin with a polyurethane foam core for the unitized body-chassis structure is described. Material considerations are discussed. Vehicle test include static torsional and beaming, dynamic torsional and beaming, creep, barrier crash, and car performance. Techniques for building the vehicle are also described.

Publ: Automotive Engineering v82 n3 p29-33, 89 (Mar 1974) 1974
Based on SAE paper "XP-898--A Passenger Vehicle Unitized Body-Chassis Structure of RP/C" by R. A. Gallant, Chevrolet Div., General Motors Corp. Presented at the 29th Conference of the Society of the Plastics Industry, Reinforced Plastics/Composites Inst., Feb. 5-8, Washington, D. C.
Availability: See publication

HS-014 579

SYNTHETIC ENGINE OILS OUTPERFORM CONVENTIONAL OILS

The performance of engine oils based on synthesized hydrocarbon fluids is described. They have proved to be superior to conventional mineral oils in terms of low-temperature fluidity, high-temperature stability, and engine cleanliness and wear in a wide range of laboratory tests. Their use in rally cars and fleets confirms their suitability for severe service.

Publ: Automotive Engineering v82 n3 p34-9 (Mar 1974) 1974
Based on SAE-740120, "Synthetic Engine Oils--A New Concept" by B. J. Miller, European Automotive Engine Oil, Mobil Oil Co. Ltd; T. W. Rogers, Mobil Res. and Devel. Corp; and W. P. Trautwein, Mobil Oil AG. Presented at the SAE Automotive Engineering Congress, Detroit, 25 Feb-1 Mar.
Availability: See publication

HS-014 580

ADHESIVE BONDING ALUMINUM BODY SHEET

The use of adhesive bonding for joining aluminum body sheet components in automobiles is described. Several alloys, selected for their formability, strength, and corrosion resistance, were tested. Service life was determined by measurement of any changes in the bonding that can occur in its service environment. Tests of fluid immersion, varying humidity, salt spray, and elevated or cryogenic temperatures showed that adhesives of the same type and of different types from various manufacturers will, because of their inherently different formulations, exhibit different initial bond strengths and performance in service. Initial bond strength of a one-component, heat cured epoxy adhesive and a low strength vinyl plastisol are compared, and data are given on bond durability, effect of surface treatment, performance of three anti-flutter adhesives, and the effects of oil on aluminum and steel surfaces.

Publ: Automotive Engineering v82 n3 p44-9 (Mar 1974) 1974
Based on SAE-740078, "Ahesive Bonding of Aluminum Automotive Body Sheet" by J. D. Minford and E. M. Vader, Chemical Metallurgy Div., Alcoa Labs., Aluminum Co. of America. Presented at the 1974 Automotive Engineering Congress and Exposition, Detroit, 25 Feb-1 Mar.
Availability: See publication

HS-014 581

DESIGNING A VARIABLE TIMING CAMSHAFT

Efforts studying nitrogen oxides emission control along with broad combustion and performance considerations are discussed and it is shown that the major materials, dimensional and actuation problems for a variable valve timing camshaft are within reach of present technology. Experimental designs being tested in a modern, volume-production V-8 engine are described. Cam advance influence at various load/speed conditions are given along with data on cam timing changes and wide open throttle performance. Results of the test program suggest that a variable valve timing camshaft can be designed to fit into the space now occupied by a standard camshaft in a V-8 engine. Emissions and other results are early and must be verified by further testing.

Publ: Automotive Engineering v82 n3 p50-3 (Mar 1974)
1974
Based on SAE-740102, "Design and Development of a Variable Valve Timing Camshaft" by C. A. Schiele, GMC Environmental Activities Staff, S. F. DeNagel, and J. E. Bennethum, GMC Res. Labs. Presented at the SAE Engineering Congress, 25 Feb - 1 Mar 1974.
Availability: See publication

HS-014 582

ROAD WIDTH REQUIREMENTS OF COMMERCIAL VEHICLES WHEN CORNERING

Factors involved in determining road widths required by commercial vehicles when cornering, which vary with vehicle design and size, are discussed, and some measurements obtained with a sample of commercial vehicles are given. The results are compared with others obtained using models, and by calculation.

by G. Brock
Transport and Road Res. Lab., Crowthorne, Berk. (England)
Rept. No. TRRL-LR-608 ; 1973 ; 26p 3refs
Availability: Corporate author

HS-014 583

SURFACE DRESSING: A SURVEY OF WINDSCREEN DAMAGE

Data from questionnaires from 11 counties about the rate of windshield breakage on new surface dressings on heavily trafficked roads, mostly rural, are presented. The greatest number of breakages occurred in the first week after laying the dressings and the total was independent of the size of the chipping used within the range 10-12.7 mm. In the next three week period, the rate of breakage was 0.41 and thereafter was little different on the sections which had been dressed from that on untreated roads. Significantly higher rates of breakage were found on surface dressed sites longer than 3 km than on shorter sites. No conclusive evidence was found to suggest improved performance with either lightly coated on uncoated chippings. Lower levels of windshield breakage were found on sites where steel-tired rollers were used in preference to rubber-tired rollers. The effect of using steel-tired rollers on surface texture depth requires further investigation.

by N. Wright
Transport and Road Res. Lab., Crowthorne, Berks. (England)
Rept. No. TRRL-LR-614 ; 1974 ; 24p 5refs
Availability: Corporate author

HS-014 584

REVIEW OF CAR-FOLLOWING THEORY

Steadily increasing volumes of traffic and the accompanying concern for safety have spawned the need for a thorough understanding on the dynamic characteristics of vehicular flow. Car-following theory has been developed as a mathematical description of traffic flow on long, straight highways in dense flow conditions. This theory, consisting of over 30 models, provides a conceptual basis for understanding traffic phenomena, permits analysis of safety considerations, allows a determination of highway capacity, and provides a basis for automatic control of vehicles. A primary appeal of the car following methodology is this consideration of the actual factors involved in the driving process. Milestones in the development of car following theory are traced from initial investigation to current studies. Theoretical justifications employed in the development of the better known models are related.

by W. E. Wilhelm; J. W. Schmidt
Publ: Transportation Engineering Journal v99 nTE4 p923-33 (Nov 1973)
1973 ; 140refs
Availability: See periodical

HS-014 585

AUTOMOBILE INSURANCE LOSSES COLLISION COVERAGES. VARIATION BY MAKE AND SERIES. 1973 MODELS. RESEARCH REPORT

This report describes variations in both the frequencies and sizes of claims for damage to 1973 model year private vehicles of twelve domestic makes and one foreign make during their first year of availability, September 1972 through September 1973. It is based on data from collision coverages, that is, insurance covering damage to the insured vehicle inself, supplied by seven insurance companies: Allstate, The Home, Kemper, Liberty, Nationwide, State Farm and Travelers. Statistics are given.

Highway Loss Data Inst., Washington, D. C.
Rept. No. HLDI-R73-2 ; 1974 ; 166p 18refs
See also HS-013 905, HS-013 934.
Availability: Corporate author

HS-014 586

LIFE AND DEATH IN YOUR AUTOMOBILE

The problem of vehicular safety throughout the world in discussed in terms of accident statistics and the possibilities of accident and injury prevention. The extensive but declining use in the United States of high-powered automobiles is described with reasons set forth for the decline. Mention is made of consumer crusade efforts for vehicle safety in such areas as air bags and seat belts and related legislation. The concern of the United Nations in this field is cited, and statistics are given on accident rates in various countries. Recommendations are offered for dealing with the problem of drunk drivers, speed, highway hazards, and car safety.

by J. R. Moskin
Publ: World v2 n6 p14-5, 19-20 (13 Mar 1973)
1973
Availability: See publication

HS-014 587

TECHNICAL ANALYSIS STUDY OF OFF-ROAD TIRES

The major problems and some of their solutions in the application of pneumatic tires, principally off-road tires, to vehicular equipment are explored. Variables attributed to the user's operation, his equipment, and the off-road tires are considered in detail. Topics of standardization, abuse, mobility, and ton-mile-per-hour are included, and the industry's need for a common vocabulary is discussed.

by W. S. Trindal
Army Mobility Equipment Res. and Devel. Center, Fort Belvoir, Va.
Rept. No. SAE-730853 ; 1973 ; 16p 6refs
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 588

OUR BOOBY-TRAPPED HIGHWAYS

The problem of hazards inherent in highway design is discussed, including: signs and lights mounted on steel poles set in concrete; wooden telephone poles that inflict severe damage rather than give way; bridge overpasses and abutments made out of concrete; improperly designed guardrails that inflict severe damage and often propel vehicles back across the stream of traffic; jagged and unyielding rock cuts; ditches and drop-offs; and roadside trees. Examples of resulting automobile accidents are cited. Public apathy to the hazards is examined along with sporadic governmental actions.

by B. Kelley
Publ: World v2 n6 p30-2 (13 Mar 1973)
1973
Availability: See publication

HS-014 589

COMPARISON OF THE PATTERN OF ACCIDENT RATES ON ROADS OF DIFFERENT COUNTRIES

The results of several studies on the effect of traffic conditions and road elements on the number of traffic accidents, based upon the data of authors from different countries, are given. The effects considered include: population and number of motor vehicles, traffic flow, carriageway width, radius of horizontal curve, shoulder width, longitudinal grade, sight distance, intersection angle, coefficient of cohesion, and speed limit. Results show that accident data for roads of different countries reveal similar trends so that measures that reduce accident frequency in one country are likely to be of value in another.

by V. V. Silyanov
Publ: Traffic Engineering and Control v14 n9 p432-5 (Jan 1973)
1973 ; 24refs
Availability: See publication

HS-014 590

THE STIRLING ENGINE

The anti-polluting and quiet characteristics of the Stirling engine are discussed in an examination of its feasibility as an alternative to the internal combustion engine. Its history and physical properties are reviewed and its practical elements described. Prototype engines developed for automotive purposes are also discussed, and the prospect of advanced Stirling engines with the specific output of gasoline engines and the thermal efficiency of diesel engines is noted. The burning of hydrogen to heat a Stirling engine is mentioned. Areas of application include refrigeration and small generators for electric power. Its reliability and advantages are emphasized.

by G. Walker
Publ: Scientific American v229 n2 p80-7 (Aug 1973)
1973
Availability: See publication

HS-014 591

SHIFT MODULATION OF ALLISON AUTOMATIC AND POWERSHIFT TRANSMISSIONS

Factors which influence transmission shift quality are identified, such as clutch size, clutch coefficient variation, gear ratio step, and clutch apply pressure characteristics. Compensation for the first three factors can be achieved by controlling the clutch apply pressure characteristics by means described as clutch capacity modulation. A fifth factor which has an influence on shift smoothness in automatic transmissions is the proper scheduling of range shifts with respect to vehicle speed, engine speed, and engine throttle position. Several methods of shift point modulation have been developed, each with its own advantages and disadvantages.

by K. B. Harmon; R. H. Schaefer
General Motors Corp., Detroit, Mich.
Rept. No. SAE-730839 ; 1973 ; 12p
Presented at the National Combined Farm, Construction & Industrial Machinery and Fuels and Lubricants Meetings, Milwaukee, 10-13 Sep 1973.
Availability: SAE

HS-014 592

EMISSION CONTROL BY FUEL INJECTION

Several experiments using an electronic fuel injection system to establish the factors in an internal combustion reciprocating engine which control exhaust emissions are described. The design requirements and specification procedures are significantly influenced by exhaust emission legislation. Instrumentation developed to measure combustion products has permitted a discriminating assessment of the various features and requirements of an electronically controlled injection system. Consideration is given to the generation of emissions, inlet system processes, combustion processes, exhaust system processes, and vehicle specification. Petrol injection is shown to offer a solution to the immediate problems of hydrocarbon and carbon monoxide control, although control of nitrogen oxides cannot be greatly influenced by fuel injection.

by T. J. Blee; J. A. T. David; N. Hunt
Publ: Journal of Automotive Engineering v3 n2 p8-14 (Feb 1972)
1972 ; 13refs
Availability: See publication

HS-014 593

THERMOPLASTIC SANDWICH MOULDINGS

The economic manufacturing of sandwich moldings out of thermoplastic materials is discussed. One industrial process is described which injects two different materials sequentially into the mold, and which increases the size of the cavity in which the molding is being produced by moving half of the mold away from the other to allow the foaming agent in the core material to expand. The stiffness of sandwich moldings is also described along with the advantages of making sandwich moldings with skins and cores of different materials. It is concluded that thermoplastic sandwich moldings are especially attractive in view of the lower rate of cost increases of plastic in relation to steel and the rising cost of labor, which can be significantly reduced by sandwich molding.

by R. M. Ogorkiewicz
Publ: Journal of Automotive Engineering v3 n2 p15-8 (Feb 1972)
1972 ; 4refs
Availability: See publication

HS-801 098

A PHOTOGRAMMETRIC SYSTEM FOR MOTOR VEHICLE ACCIDENT INVESTIGATION. FINAL REPORT

A twin camera sterometric unit was fabricated, mounted on a portable carrier with 36 inches spacing for the camera lenses. The unit was calibrated and its net accuracy capabilities were determined. A variety of applications were studied, including: mapping the accident site both on scene with evidence present, and on site after evidence was removed; photographing a vehicle in an effort to determine the qualitative data (type of damage) and quantitative data (specific measurements) available for study at any time the photographs are to be reviewed; and photographing a victim of an accident seeking qualitative and quantitative data. Major emphasis for the study centered around utilization problems and potential contributions to multidisciplinary studies.

by C. G. Bryner
Utah Univ., Salt Lake City. Dept. of Civil Engineering
Contract DOT-HS-047-1-138
Rept. No. Utah-3046 ; 1974 ; 109p 42refs
Report for 27 Jun 71 - 27 Jun 1973.
Availability: NTIS

HS-801 109

SCHOOL BUS DRIVER INSTRUCTIONAL PROGRAM. FINAL REPORT

Procedures used to develop and pilot test a School Bus Driver Instructional Program to fulfill the requirement of Highway Safety Program Standard No. 17, Pupil Transportation Standard, are presented. The program comprises 13 units: five for developing the minimum (core) skills and knowledge needed by the driver; and eight supplemental (advanced) units imparting additional skills and knowledge that the proficient driver might require. In total it encompasses as much as 56 hours of classroom and in-bus instruction, depending on the units selected to satisfy state or local school district needs. The program is in three volumes: the Course Guide, the Instructor's Guide, and the Trainee Study Guide.

by S. P. Schumacher
Applied Science Associates, Inc., Valencia, Pa.
Contract DOT-HS-339-3-652
1974 ; 41p 26refs
Report for 1 Apr 1973 - 28 Feb 1974.
Availability: NTIS

HS-801 122

DEVELOPMENT OF TECHNIQUES TO PREVENT OCCUPANT EJECTION DURING ROLLOVER. VOL. 1--EXECUTIVE SUMMARY. FINAL REPORT

A rollover test facility was designed and developed to conform with specifications of FMVSS 208, Notice 9. The facility was used to perform vehicle rollovers, using various types of standard production sedans. Test results indicate that difficulties exist in achieving repeatable vehicle rollover kinematics under successive tests where test control parameters are very similar and in conformance with basic requirements of FMVSS 108. Results appear to be at variance with results of other similar tests. The net project result prevented quantitative evaluation of occupant ejection potential during rollover, and resulted in project direction toward critical test parameters and analyzing kinematics differences for successive tests.

by J. S. McKibben; G. S. Clark; L. E. Carlson
Agbabian Associates, El Segundo, Calif.
Contract DOT-HS-214-2-367
Rept. No. AA-R-7228-3158 ; 1974 ; 53p
Report for May 1972 - Oct 1973.
Availability: NTIS

HS-801 134

ALCOHOL AND HIGHWAY SAFETY. A REVIEW IN QUEST OF REMEDIES (L'ALCOOL ET LA SECURITE ROUTIERE)

An alcohol-highway safety study was conducted by Canada as part of an international program to improve the exchange of views and experience among NATO countries regarding environmental problems. Visits to member nations were made along with the circulation of a drinking driver questionnaire, and the 28 replies were assessed. Roadside survey techniques were developed, as were four projects to evaluate existing Canadian countermeasures. It was found that most countries have taken steps to dissuade drivers from drinking; two common countermeasures are legal restrictions for vehicle usage and public education. It was shown that, since drinking and driving is tied to the drinking habits in a country and society's general attitudes, countermeasures must vary from country to country.

Canada Ministry of Transport, Ottowa, Ont. (Canada) Road and Motor Vehicle Traf. Safety; Committee on the Challenges of Modern Society, Brussels (Belgium)
Rept. No. CCMS-28; CDSM-28 ; 1974? ; 63p 96refs
Available in French. Prepared in cooperation with the National Hwy. Traf. Safety Admin.
Availability: Corporate authors

HS-801 135

ROAD SAFETY PILOT STUDY. FINAL REPORT. (L'ETUDE PILOTE SUR LA SECURITE ROUTIERE)

A final report is presented on a NATO pilot study of environmental and other problems which significantly impair the quality of life in modern industrialized societies. Topics and countries assigned study responsibility include: pedestrian safety (Belgium); alcohol and highway safety (Canada); motor vehicle inspection Federal Republic of Germany); identification and correction of road hazards (France); emergency medical services (Italy); accident investigation (The Netherlands); and experimental safety vehicles (United States). International coordination and cooperation is reviewed in terms of road safety action, program information exchange and post-pilot study activities. Appendices provide data on international motor vehicle fatality and associated statistics, pilot study history, international resolution on road safety format for exchanging programs, and documents published under the auspices of the Road Safety Pilot Study.

Committee on the Challenges of Modern Society, Brussels (Belgium)
Rept. No. CCMS-21; CDMS-21 ; 1974 ; 117p
Available in French. Prepared in cooperation with the National Hwy. Traf. Safety Admin.
Availability: Corporate author; NHTSA

HS-820 159

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS, APRIL 1, 1971--JUNE 30, 1971. DETAILED REPORTS

Letters of notification and other communications to dealers and their customers regarding possible defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D. C.
Rept. No. PB-200 927 ; 1971 ; 569p
Availability: NTIS

HS-820 169

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS, JULY 1, 1971--SEPTEMBER 30, 1971. DETAILED REPORTS

Letters of notification and other communications to dealers and their customers regarding possible defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D. C.
Rept. No. PB-204 277 ; 1971 ; 556p
Availability: NTIS

HS-820 172

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS, OCTOBER 1, 1971--DECEMBER 1, 1971. DETAILED REPORTS

Letters of notification and other communications to dealers and their customers regarding possible defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D. C.
1971 ; 617p
Availability: NTIS

HS-820 207

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS, APRIL 1, 1972--JUNE 30, 1972. DETAILED REPORT

Letters of notification and other communications to dealers and their customers regarding possible defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D.C.
1972 ; 678p
Availability: NTIS

HS-820 292

MOTOR VEHICLE SAFETY DEFECT RECALL CAMPAIGNS, JANUARY 1, 1973--MARCH 31, 1973. DETAILED REPORTS

Letters of modification and other communications to dealers and their customers regarding possible defects in vehicles produced by domestic and foreign manufacturers are presented without commentary.

National Hwy. Traf. Safety Administration, Washington, D.C.
1973 ; 807p
Availability: NTIS

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CONTRACTS AWARDED

NHTSA CONTRACTS AWARDED

DOT–HS–010–1–176 Mod. 4

AIR BAG EQUIPPED FLEET TEST VEHICLES

University of Southern California
University Park
Los Angeles, California 90007

To be completed by 31 Oct 75

$300,000.00

USC shall perform certain acquisition and investigation activities related to the Air Cushion Restraint Systems (ACRS) in Region V, in the endeavor to estimate the injury reducing efforts of the ACRS, to determine the operational characteristics of the ACRS, and evaluate public/owner acceptance of it. Accident data criteria is that the vehicle must be towed or injury must have occurred. In ACRS vehicles, deployment must have occurred if other conditions are not satisfied. School bus accidents involving fatalities or other special accidents as directed by the Contract Technical Manager will be investigated.

DOT–HS–031–3–749 Mod. 1

VALIDATION STUDIES FOR HEAD IMPACT INJURY MODEL

The University of Michigan
260 Research Administration Bldg.
Ann Arbor, Michigan 48105

Extended to 1 Jan 75

$35,480.00

The plan of work and methodology involving experiments using the heads of animals and cadavers to validate an analysis model for various impact situations is refined and expanded. Object of this series of tests is to conduct controlled head impacts of increasing severity to the occipital regions of four species of primates until micro and macro pathological studies indicate a significant brain injury has occurred. The same series of tests will be performed on eight fresh unembalmed cadaver heads.

DOT–HS–046–2–468 Mod. 5

ESV CRASH TESTS

Dynamic Science
Division of Ultrasystems, Inc.
1800 West Deer Valley Drive
Phoenix, Arizona 85027

Extended to 19 Oct 73

$5,350.00

Additional crash data in frontal barrier crash tests will be gathered according to test requirements furnished by NHTSA.

DOT–HS–053–3–609 Mod. 4

A TRI-LEVEL STUDY OF THE CAUSES OF INJURY IN TRAFFIC ACCIDENTS

Calspan Corporation
4455 Genesee Street
Buffalo, New York 14221

1 Jan 74 to 31 Oct 75

$649,854.00

Basic work as stipulated in this contract will be continued to establish a base line of driver, vehicle, and highway accident exposure and gross accident experience in the defined area; detailed accident data will be collected on selected vehicles; the occupant injury cause and severity will be determined, as well as the accident type and severity. In addition, a program has been designed by NHTSA to evaluate the effectiveness of the Air Cushion Restraint System (ACRS) to be introduced as optional equipment in 1974/75 cars. Data collection from this program covering a 13-state area should help estimate the injury reducing effects of the ACRS, determine the operational characteristics of the ACRS, and evaluate the public/owner acceptance of it.

DOT–HS–053–3–658 Mod. 1

MATHEMATICAL RECONSTRUCTION OF ACCIDENTS

Calspan Corporation
P.O. Box 235
Buffalo, New York 14221

25 Jun 74 to 25 Sept 74

$24,977.00

Calibration factors will be developed for anthropomorphic dummies on the basis of injuries to living humans involved in actual highway accidents. The overall concept of using a digital computer program to process data transmitted from the accident scene and provide reconstructions of the accident crash will be field tested. Based upon this field experience, the mathematical reconstruction system will be modified and expanded as required. The initial pilot study will be made using ten accident cases. Based on the initial findings, the dummy calibration study will be expanded as appropriate.

DOT–HS–060–3–671 Mod. 2

AIR BAG EQUIPPED FLEET TEST VEHICLES

The University of Miami
Coral Gables, Fla. 33124

Extended to 31 Oct 75

$160,000.00

This modification supersedes Change Order No. One (1) and provides an additional Task IV. Objectives of this national effort are to estimate the injury reducing effects of the Air Cushion Restraint System (ACRS), determine the operational characteristics of the ACRS and evaluate public/owner acceptance of it. The Contractor will perform certain acquisitions and accident investigation activities in the six State area of Region II, tallying basic accident information and investigating accidents to meet the sampling criteria specified in the National Air Cushion Restraint System Evaluation Plan. Contractor will also investigate school bus accidents resulting in at least one fatality or as may be directed by the NHTSA.

DOT–HS–067–1–087 Mod. 17

THE FAIRFAX ALCOHOL SAFETY ACTION PROJECT

Virginia Highway Safety Division
Post Office Box 27472
Richmond, Va. 23261

Extended to 31 Dec 74

$400,000.00

This modification provides for the extension of the operational period of the countermeasure portion of the Fairfax ASAP.

DOT–HS–074–3–582IA Mod. 1

NHTSA ACTIVITIES IN THE NATIONAL CLEARINGHOUSE FOR ALCOHOL INFORMATION

National Institute of Mental Health (NIMH)
Parklawn Building, Room 7026
5600 Fishers Lane
Rockville, Md. 20852

8 Jun 74 to 8 Jun 75

$100,000.00

The same work as previously specified will be continued by NIMH.

DOT–HS–120–3–544 Mod. 13

REAR AXLE CONTROL ARM FAILURE

Essex Corporation
303 Cameron Street
Alexandria, Va. 22314

17 Jun 74 to 19 Jul 74

$7,904.00

By modifying rear axle control arms so that various types of failures can be simulated, the effects of partial and complete fractures of rear axle control arms on a Chevrolet C–10 truck will be measured. The extent of crack propagation in these control arms will be determined when the vehicle is test run through rough, though not severe, road conditions.

DOT–HS–137–3–648 Mod. 2

TECHNICAL AND OPERATIONAL ASSISTANCE-FATALITY ANALYSIS FILE

Genasys Corporation
4853 Cordell Avenue
Suite A 10
Bethesda, Md. 20014

Extended to 28 Jun 74

$80,758.00

Contractor will be required to process only those FAF cases received by him through 15 June.

DOT–HS–159–2–249 Mod. 12

ALCOHOL SAFETY ACTION PROJECT

State of Utah
Department of Public Safety
317 State Office Building
Salt Lake City, Utah 84114

Extended to 30 Oct 75

$8,700.00

The Contractor's Detailed Project Plan entitled "Utah Wasatch Front Alcohol Safety Action Project," dated 7 June 1972, as revised 10 October 1972, with subsequent changes, is incorporated into the contract by reference. Completion date for management and evaluation of the project, and for submission of the final report is extended.

DOT–HS–163–2–256 Mod. 13

ALCOHOL SAFETY ACTION PROJECT

City of Sioux City
P.O. Box 447
Sioux City, Iowa 51102

No change

$34,305.00

The initial Detailed Project Plan, dated 15 November 1971 and effective 18 January 1972, as revised, is further revised by incorporating Change No. 8, dated 20 May 1974. Additional funds are allotted.

DOT–HS–191–3–759 Mod. 1

AN EVALUATION OF ALCOHOL SAFETY ACTION PROJECT (ASAP) REHABILITATIVE EFFORTS

The University of South Dakota
Vermillion, South Dakota 57069

25 Jun 73 to 31 Dec 75

$261,690.00

This modification allows for an extension of time for a more comprehensive approach to the preparation of final system descriptions and models necessitated by requests from OAC to include Pre-sentence Investigation and Probation activities. General requirements of the contract will be to describe the community and judicial climate of each of 26 ASAPs, and to fully describe and evaluate the activities of the Pre-sentence Investigation, Probation and Rehabilitation systems at each site.

DOT–HS–198–3–770 Mod. 1

SPECIAL FIELD STUDY—ALCOHOL INVOLVEMENT

Maryland Medical-Legal Foundations, Inc.
Office of Chief Medical Examiner of Maryland
Central Anatomic Laboratory, Dept. of Mental Health
111 Penn Street
Baltimore, Md. 21201

Extended to 30 Jun 75

$128,750.00

In this third and final year of a special involvement accident study, the basic objectives will continue to be to discover the causal factors associated with driver fatal motor vehicle accidents as compared to a matched sample of live driver accidents, especially the relationships of the alcohol/drug involvement in each sample. The Contractor will investigate all fatal driver collisions which occur in the vicinity of Baltimore in an effort to determine contributing factors. Human, vehicle and environmental aspects will be analyzed through a psychological autopsy, of the deceased driver, and evaluation of his drinking habits and a medical autopsy. Comparison of fatal/non-fatal driver accidents will involve matching criteria as to day of week and approximate time of day, proportion of alcohol-involved cases, same appropriate level of intoxication, and proportion of single vs. multiple vehicle collisions.

DOT–HS–201–3–766 Mod. 2

RECREATIONAL VEHICLE ACCIDENT INVESTIGATION STUDY

University of Kentucky Research Foundation
East Wing, Kinkead Hall
Lexington, Kentucky 40506

No change

$19,800.00

The Contractor will investigate all crashes involving passive restraint and/or crash recorder equipped vehicles forming a part of the NHTSA fleet located in his general area, and any similarly equipped vehicle crashes as may be designated by the Contract Technical Manager, (CTM). He shall also be prepared to investigate all school bus accidents occurring in his area which involve three or more fatally injured passengers or which may be designated by the CTM.

DOT–HS–204–3–672 Mod. 4
SB3–2–8(a)–73–C–448

EFFECTIVENESS OF THE FATAL ACCIDENT REDUCTION AND ENFORCEMENT (FARE) PROGRAM

J. A. Reyes Associates, Inc.
1140 Connecticut Ave., N.W.
Washington, D.C. 20036

This contract is awarded by the Small Business Administration under the authority of Section 8(a) of the Small Business Act (15JSC 637(a), and will be administered by the Department of Transportation, National Highway Traffic Safety Administration.

Extended to 30 Dec 74

$20,763.00

The Contractor will measure the consistency and estimate the veracity of the Fatal Accident Reduction and Enforcement (FARE) data as submitted from the nine site FARE reports received. Comparisons

will be made between FARE and non-FARE areas/times. Three such comparisons will be accident profiles for FARE road segments in Idaho and those for adjacent road segments on either side of the FARE segment; accident profiles for Massachusetts as to FARE and non-FARE days; and times and the same day/time comparisons for the Maryland area.

DOT–HS–213–3–695 Mod. 3

APL/JHU HYBRID VEHICLE HANDLING PROGRAM

Department of the Navy
Naval Ordnance Systems Command
Washington, D.C. 20360

No change

$29,000

Modification to provide funds for computational support of Contract DOT–HS–4–00900.

DOT–HS–4–00891

ASSESSMENT OF FEDERAL, STATE AND LOCAL PEDESTRIANS/BICYCLE SAFETY FUNDING AND FUNDING CAPABILITIES

Small Business Administration
1 Decker Square
Suite 400, East Lobby
Bala Cynwyd, Penna. 19004

13 May 74 to 1 Sept 74

$40,200.00

The Contractor shall review and analyze all documentation available within the Department of Transportation relating to actual or estimated costs for implementing pedestrian and bicycle safety programs. Documents to be analyzed will include the 1968 Highway Safety Needs Study, State Comprehensive Highway Safety Program Plans, State Annual Work Programs, and National Highway Traffic Safety Administration pedestrian/bicycle safety research projects. A profile for Pedestrian and Bicycle Standards will be developed to describe safety programs, categories, and components in observational terms. Contractor will also prepare an estimate of current Federal, State and local funding of pedestrian/bicycle safety programs.

DOT–HS–4–00893

50th PERCENTILE MALE ANTHROPOMORPHIC TEST DUMMY

Humanoid Systems
5250 El Segundo Boulevard
Hawthorne, Calif. 90250

To be completed one year from date of contract award

$3,960.00 each dummy

Part 572 of Federal Motor Vehicle Safety Standard (FMVSS) 208 provides the guidelines for the anthropomorphic dummies to be produced by the Contractor. Each dummy will meet or surpass all of the provisions of Part 572 of FMVSS 208. An estimated total of 18 dummies will be ordered by the National Highway Traffic Safety Administration Contracting Officer.

DOT–HS–4–00894

50TH PERCENTILE MALE ANTHROPOMORPHIC TEST DUMMY

Sierra Engineering Company
123 East Montecito Avenue
Sierra Madre, Calif. 91024

To be completed one year from date of contract award

$5,250.00 each dummy

Part 572 of Federal Motor Vehicle Safety Standard (FMVSS) 208 provides the guidelines for the anthropomorphic dummies to be provided by the Contractor. Each dummy will meet or surpass all of the provisions of Part 572 of FMVSS 208. An estimated total of 18 dummies will be ordered by the National Highway Traffic Safety Administration Contracting Officer.

DOT–HS–4–00895

50TH PERCENTILE MALE ANTHROPOMORPHIC TEST DUMMY

Alderson Research Laboratories, Inc.
390 Ludlow Street
Stamford, Conn. 06904

To be completed one year from date of contract award

$5,583 each dummy

Part 572 of Federal Motor Vehicle Safety Standard (FMVSS) 208 provides the guidelines for the 18 anthropomorphic test dummies which will be provided by the Contractor. Each dummy will meet or surpass all of the provisions of Part 572 of FMVSS 208. An estimated total of 18 dummies will be ordered by the National Highway Traffic Safety Administration Contracting Officer.

DOT–HS–4–00896

UNIFORM TIRE QUALITY GRADING—TREADWEAR

South Texas Tire Test Fleet, Inc.
Drawer J
Devine, Texas 78016

To be completed sixty days after contract award

$23,936.00

Two four-car convoys, each convoy having a different make car, will be run simultaneously over the same route but will be separated by a sufficient gap as to be considered separate convoys. Convoy and car rotations will be used to equalize conditions between the two. With these precautions, the program will permit a direct evaluaiton of the effect of the car make on the treadwear of the control tire.

DOT–HS–4–00933

PROTECTIVE SYSTEM PERFORMANCE STUDY USING VOLUNTEER HUMAN SUBJECTS, CADAVERS, ANIMALS AND DUMMIES

Southwest Research Institute
8500 Culebra Road
San Antonio, Texas 78284

28 Jun 74 to 30 Dec 74

$82,951.00

Static and dynamic sled tests using the "stepped severity" concept with anthropometric dummies, animals, human cadavers and living volunteer subjects will be made with air bag restraints, belt systems, hybrid systems, components, windshields, instrument panels, child and infant restraints. Objectives are to measure the dynamic responses of humans, animals and dummies when restrained by advanced or passive belt or inflatable restraint systems and subjected to dynamic deceleration-time simulated crash pulses; to evaluate the performance of each restraint system tested as a viable safety device for protection under real crash conditions; to determine the effects and/or injury levels produced by various restraint systems on the test subjects under simulated impact/crash conditions; and to evaluate simulation, scaling and instrumentation techniques and determine their effectiveness as related to the real world crash environment.

DOT–HS–4–00943

EFFECTS OF TIRE PROPERTIES ON TRUCK AND BUS HANDLING

The Regents of the University of Michigan
260 Research Admin. Bldg.
The University of Michigan
Ann Arbor, Mich. 48105

To be completed by 31 Dec 75

$265,800.00

The Contractor shall conduct a limited laboratory test program of truck and bus tires which will include bias belted, radial, and cross-bias construction, both highway and cross rib treads, in large and small sizes, and wide-base single/low aspect ratio. Tire performance will be measured for aligning torque, side force capability, and overturning moment for various slip angles and loads. The properties of tires that affect the handling response of trucks and buses are to be identified and the degree to which the various tire parameters affect the handling response of the vehicles will be validated and assessed by full-scale testing.

DOT–HS–4–00946

A COMPARISON OF ALCOHOL INVOLVEMENT IN PEDESTRIANS AND PEDESTRIAN CASUALTIES

Dunlap and Associates, Inc.
One Parkland Drive
Darien, Conn. 06820

To be completed by 30 Jun 76

$276,410.00

Using procedures developed for the collection of Blood Alcohol Concentration (BAC) levels from living pedestrians, a study will be conducted comparing fatally injured pedestrians, non-fatally injured pedestrians and pedestrians similarly exposed but not involved in an accident. Data will include BAC levels and pedestrian behavior. Basic purpose of the study is to determine if alcohol is over-involved in pedestrian fatalities and/or accidents, and if there are significant differences in pedestrian behavior associated with different BAC levels. Information gained regarding alcohol involvement and pedestrian behavior will be used to determine whether or not special countermeasure steps should be taken with respect to the alcohol-involved pedestrian.

DOT–HS–4–00947

SURVEY OF SAFETY-RELATED DEFECTS IN SCHOOL BUSES

Applied Science Associates, Inc.
Box 158
Valencia, Pa. 16059

25 Jun 74 to Jun 75

$77,361.00

In an effort to determine those safety-related defects in school buses that have a potential for causing an accident, the Contractor will survey the activities of school bus operators major problem areas involving safety-related defects for appropriate corrective actions by the manufacturers, State officials, or the bus drivers themselves. This survey is to be limited to those defects that are the responsibility of the manufacturer as differentiated from defects caused by lack of vehicle maintenance or normal degradation. Where necessary to support a defect trend, physical inspection and photographic documentation of suspect items on buses will be made to substantiate the existence of a safety-related defect.

DOT–HS–4–00949

STATIC BRAKE INSPECTION INVESTIGATION

Avco Systems Division
201 Lowell Street
Wilmington, Mass. 01887

To be completed by 31 Dec 75

$261,991.00

The Contractor will systematically investigate, develop, construct, and verify test techniques, criteria, and equipments capable of determining the mechanical and hydraulic condition of the braking system in the static state without removing wheel assemblies. A state-of-the-art survey will be made into existing static brake inspection systems, proposed designs, inspection criteria and techniques in an effort to determine basic performance objectives and potential approaches to them. Analysis and evaluation of the more promising approaches will be used to determine the optimum static brake inspection systems to be constructed as prototype systems. The operational capabilities of the equipment and the validity of the inspection criteria and techniques to detect and assess the condition of automotive braking systems in the static state are to be demonstrated and verified.

DOT–HS–4–00952

EXPERIMENTAL FIELD TEST OF PROPOSED PEDESTRIAN SAFETY MESSAGES

Dunlap and Associates, Inc.
One Parkland Drive
Darien, Conn. 06820

To be completed by 31 Aug 76

$176,450.00

A field test of five safety messages will involve a multiple safety message campaign in certain prese lected cities and assessment of their effectiveness in reducing the specific types of pedestrian accident they were designed to counter. The messages, pre viously developed by the Contractor, focus on a variety of accident types and are directed separately at both pedestrians and drivers. Evaluation of the safety messages will be based principally on their effective ness in reducing specific types of pedestrian accidents

DOT–HS–4–00957

HEADLIGHT FACTORS AND NIGHTTIME VISION

Honeywell, Inc.
Systems Research Center
2700 Ridgeway Parkway
Minneapolis, Minn. 55413

28 Jun 74 to 30 Aug 75

$72,300.00

To evaluate the feasibility of the eye movement ap proach as applied to studies of headlamp effectiveness the Contractor will measure drivers' search and scan patterns under various driving conditions with differ ent headlamp systems. Experimental tests will b conducted on actual roadways having the character istics of a two-lane rural road without fixed illumina tion and without edge markings. Intent is to discove whether or not detection distance can be inferred fron driver's behavior in a situation where the driver i not instructed to search for a target. The Contracto shall check the possibility of determining what type of targets and target locations are relevant based o an analysis of fixed object and pedestrians crashe described in the Multidisciplinary Accident Investi gation file.

DOT–HS–4–00958

EVALUATION AND SYSTEM DESCRIPTION OF ASAP JUDICIAL SYSTEMS

Indiana University
Box F
Bloomington, Ind. 47401

28 Jun 74 to 30 Jun 75

$96,531.00

It is not known what type of legal-judicial system provides the most cost-effective means of handling Driving Under the Influence (DUI) cases. The objective of this contract is to aid in the overall evaluation efforts of the Office of Alcohol Countermeasures (OAC) in determining the effectiveness of Alcohol Safety Action Projects (ASAPs) adjudication systems. By reviewing detailed plans and report data, making site visits, and a study of the statutes, the Contractor shall analyze the effects of jury and non-jury trials on the system, plea-bargaining, scoff-laws, court delays, "implied consent" refusals and the quality of driver record system on the judicial system.

DOT–HS–4–00959

INSTRUCTOR–TRAINING INSTITUTE FOR NHTSA CURRICULUM PACKAGE: DETECTION AND APPREHENSION OF DWI DRIVER

Dunlap and Associates, Inc.
One Parkland Drive
Darien, Conn. 06820

To be completed nine months after contract award

$94,153.00

An Instructor Institute will be conducted in conjunction with the publication of the new NHTSA curriculum set, *Detection and Apprehension of DWI Driver*. This project will provide a 30-hour training course in applied methods and techniques for instructing the published course. Approximately 100 selected State or local instructors will be trained in groups of 10 at 5 site locations. Candidate-Instructors may be assumed to be locally qualified and competent traffic law enforcement officers with experience in detection and apprehension of DWI drivers. The Contractor will be responsible for all arrangements concerning this Institute.

DOT–HS–4–00960

ACCIDENT AVOIDANCE SKILL TRAINING AND PERFORMANCE TESTING

URS/Matrix Company
7425 Arlington Blvd.
Falls Church, Va. 22042

28 Jun 74 to 31 Dec 75

$132,513.00

The purpose of this project is to investigate the feasibility and potential effectiveness of a unique instructional and testing approach to accident avoidance that can be applied in both program areas. The objectives are to analyze the events which immediately precede a crash; derive the driver behavioral requirements for accident avoidance imposed by those events; identify/develop ways and means for training and testing these skills; determine whether people can be trained to acquire these skills and what that training will cost; and to develop an experimental plan to determine whether those who possess advanced skills do in fact, have fewer accidents. These objectives are reached, an attempt will be made to formulate training/testing programs which will facilitate the development of such skills for the broadest possible spectrum of the driving population.

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
Office of Administration
WASHINGTON, D.C. 20590

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